

DOCUMENT RESUME

ED 048 093

SP 004 567

AUTHOR Le Baron, Walter Alvin, III
TITLE The Education Industry Planning Consultant: An
Emerging Role.
PUB DATE 21 May 70
NOTE 264p.; Doctoral dissertation presented at George
Washington University, Washington, D.C., May 1970
EDRS PRICE EDRS Price MF-\$0.65 HC-\$9.87
DESCRIPTORS *Consultants, Education, *Educational Planning,
Industry, Public Schools, School Industry
Relationship, *Staff Role

ABSTRACT

This study defines the role of the education-industry planning consultant. The planning consultant is envisioned as an independent agent who will be concerned with improving the interaction among school districts and the education industry through facilitating the use of comprehensive, long-range planning. He is seen as functioning to provide a common ground among the parties involved in educational planning. Following an introductory chapter, two chapters discuss the background to the problem. Chapter 2 develops the present status of education-industry relationships, and Chapter 3 presents a theory of educational planning. Chapter 4 presents a description of the education-industry planning consultant's role. This chapter includes the reactions of a selected jury of respondents who were asked to predict the value of the role. Chapter 5 summarizes the study and presents recommendations based upon it. (Author/RT)

Copyright By
WALTER ALVIN LE BARON III

1970

"PERMISSION TO REPRODUCE THIS COPY-
RIGHTED MATERIAL HAS BEEN GRANTED
BY Walter Le Baron III

TO ERIC AND ORGANIZATIONS OPERATING
UNDER AGREEMENTS WITH THE U.S. OFFICE
OF EDUCATION. FURTHER REPRODUCTION
OUTSIDE THE ERIC SYSTEM REQUIRES PER-
MISSION OF THE COPYRIGHT OWNER."

U.S. DEPARTMENT OF HEALTH, EDUCATION
& WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED
EXACTLY AS RECEIVED FROM THE PERSON OR
ORGANIZATION ORIGINATING IT. POINTS OF
VIEW OR OPINIONS STATED DO NOT NECES-
SARILY REPRESENT OFFICIAL OFFICE OF EDU-
CATION POSITION OR POLICY.

The Education Industry Planning Consultant
An Emerging Role

Walter Alvin Le Baron III

B.A. 1960, State University of New York, Albany
M.A. 1961, The University of Colorado, Boulder

A dissertation submitted to the Faculty of the
School of Education of the George Washington
University in partial satisfaction of the
requirements for the degree of Doctor of Education

May 21, 1970

Washington, D.C.

ED048093

P004567

This Study is Dedicated to:

Beatrice Martin Le Baron

and

Vikki Zygmunt

Two Friends of

Then and Now

Directed by Wesley Thomas Carroll

Professor of Education

iii

TABLE OF CONTENTS

LIST OF FIGURES	vi
CHAPTER	
I. INTRODUCTION	1
Statement of the Problem	
Rationale and Assumptions	
Limitations	
Sources of the Data	
Development of the Study	
Definitions	
Need and Significance	
II. THE INDUSTRY-EDUCATION RELATIONSHIP	10
Introduction	
Industry Interest in Education	
Some Background Concerns	
The Emergent Education-Industry Relationship	
III. THE PROGRESS AND ORGANIZATION OF PLANNING	76
Introduction	
Sources of a Definition for Educational Planning	
A Definition of Educational Planning	
Theoretical Bases for Educational Planning	
Organization of the Planning Process	
Implications from this Analysis of Planning	

CHAPTER		
IV.	THE EDUCATION INDUSTRY PLANNING CONSULTANT . .	162
	Introduction	
	Sources of the Role	
	A Note on Methodology	
	Description of the Model and Reports of the	
	Original Testing	
	The Consultant's Qualifications:	
	Education and Experience	
	Organizational and Contractural Relationships	
	Methods and Operations	
	Conclusions	
V.	CONCLUSIONS AND RECOMMENDATIONS	229
	Guidelines for Application of the Findings	
APPENDIX		233
BIBLIOGRAPHY		251

LIST OF FIGURES

FIGURE

1.	The School and Industry Approach Education In Very Differnt Ways -----	36
2.	A Methodology for Designing Alternative Systems -	108-109
3.	The Total Desing Process -----	111
4.	Seven Levels of Planning -----	115-117
5.	The Macro System of the School System -----	122-125
6.	A Framework for the Development of Educational Learner-Based Educational Programs -----	126
7.	Relating Individual and Organizational Objectives -----	128
8.	An Integrated Planning Model -----	130
9.	The Consultant Common Ground Between Education and Industry -----	204

CHAPTER I

INTRODUCTION

The interrelationships of the institutions and organizations within the American culture are changing radically in response to new and seemingly endless technological advances. Value systems sometimes seem confused; sources of authority shift from well established, traditional patterns, to new forms of special expertise developed to meet the emerging problems of predicted alternative futures. Through all this change the schools find themselves in a state of flux, called upon to undertake virtually impossible challenges and to work with new and frequently strange forces representing these technological thrusts.

The educator in the midst of these changes finds himself confronted with the conflicting demands of decision-making and critical, disinterested analysis, a position peculiarly suited to conflict, but one offering exciting challenges, because as Etzkowitz and Schflander state:

To try to be an omniscient, rigidly objective, or value-free observer from afar is not only to abdicate from one's responsibilities as a citizen but to condemn oneself to be an essentially irrelevant critic; for it is only by participating in the most important and macroscopic areas

of life in one's society (and in our society that means large and complex organizations) that one will have the relevant resources, data, and materials to develop a proper analysis of that society.¹

In this spirit the questions concerning the effective relations among industry and education can be approached as basic to understanding the directions of change in the institution of education. The field deserves careful attention, and one small part of it is dealt with in this study.

STATEMENT OF THE PROBLEM

This study will define a developing educational role: the education-industry planning consultant. The role envisions an independent agent who will be concerned with improving the interaction among school districts and the education industry through facilitating the use of comprehensive, long-range planning. He is seen as functioning to provide a common ground among the parties involved in educational planning.

The industrial community, at once the consumer of the school's products and the supplier of its needs, relates in a host of ways to the institution of education. During the past five years (or with the inclusion of some historical precedents, perhaps twenty years) an "education industry" has developed. This group, composed

¹Henry Etzkowitz and Gerald M. Schaflander, "A Manifesto for Sociologists: Institution Formation--A New Sociology," Social Problems, reprint, undated.

many traditional elements--text publishers, furniture manufacturers--and some new concerns--computer software houses, magazine publishers, and film makers--seeks to directly affect the nature of the curricular aspects of the schools. The change is one from passive supplier of components to active developer of programs. These industries see themselves as contributing to the process of education; they are too often seen as exploiting the public domain. In response to these changes new formats of interaction and cooperative planning are required, and the education-industry planning consultant is seen as one aspect of these new relationships.

RATIONALE AND ASSUMPTIONS

The schools, in their relationships with industry, are faced with several choices: to compete, to cooperate, or to plan integrated approaches to educational planning. In either case, a condition of mutual suspicion may be maintained or it can be mollified by effective models of interaction. Within this context the following assumptions guide this study:

1. Technological processes (the concern will be with the process, not the gadgets) developed by industry can make useful contributions to the public schools, but they require an explicit planning process.
2. The future will witness a closer relationship between schools and industries, not only because of potentially increasing profits from an expanding industry but because of the increased centrality of education within our culture and the necessity for mutual program planning and development.

3. Education as a field has not devoted adequate resources to the development of planning capabilities (along with the concomitant processes of research and development or to the development of planning roles and functions). Education can find significant expertise within the industrial community which can be useful itself and which can serve as background for the development of educational planning missions.
4. The collection of planning techniques, sometimes grouped under the headings of long-range, comprehensive planning or "systems analysis," provides a strong potential resource for education, when they are carefully defined and applied. This use will require the specific design of their application to educational planning.
5. The average school district could not support the kind of planning expertise envisioned by this consultant role. (Indeed, he must be a man with one foot in each of two different worlds: education and industry). This consideration requires the careful development of an outside consultant role.
6. Unless such careful planning techniques are implemented, the public schools will face increasing difficulty in using the technological developments and in the operation of total institutional planning.
7. The education-industry planning consultant appears to indicate one viable alternative for developing improved education-industry relationships through the use of long range, comprehensive planning techniques.

LIMITATIONS

The following limitations are envisioned by this statement:

1. The study is concerned with the area of curriculum and instruction; the construction of buildings and facilities or provision of institutional services will be of interest only as they may affect planning of the school's program.

MAR 29 1971

12

2. The study is concerned with the application of planning techniques to the field of education. It views these techniques as having developed through the efforts of industry and as productive for the public schools. The study, however, is not concerned directly with the planning, development, or implementation of any specific technological device or process, except as examples may contribute to an understanding of planning processes.
3. The study is limited to a concern for the public schools (as opposed to the whole of education) in a system-wide context.
4. In general, the study will be concerned with developments during the past five-to-ten years, since this period spans the new form of industrial involvement with the problems of education in the public schools.

SOURCES OF THE DATA

Since this essentially theoretical study will define a specific role in relation to institutions, the extant research can contribute but has not necessarily operated within the parameters of this study. Primary sources of data, therefore, must include the following:

1. The broad literature on planning (management planning, comparative education, futures-planning, and systems analysis), consulting, and educational-industry relationships.
2. Selected special studies, monographs, research reports, and evaluation studies, as appropriate.
3. Site visits, interviews, and other contacts with individuals presently involved in either the consulting role or with projects which help define the need (and limitations) on such a role.

Since the study is intended to explicate an operational theory, the collection of new data through the use of a formal data

collection instrument will not be undertaken. It will, however, make use of the interview and case study formats as appropriate.

DEVELOPMENT OF THE STUDY

Following Chapter I, two chapters will discuss the background to the problem. Chapter II develops the present status of education-industry relationships, and Chapter III presents a theory of education planning for use within the universe described by Chapter II. Each of these chapters will include a review of the literature, an analysis of present theories in the field, and some interpretation of the events which help define the consultant role. Interview material, reports of site visits, and/or case studies will be included within these chapters.

Chapter IV presents a description of the education-industry planning consultant's role, which emerges from the study, including functions, roles and relationships, background and experience, and potential contract relationships. The chapter includes the reactions of a jury of respondents who have been asked to predict the value of the role. Procedures for the study, including modification of the "Delphi technique," are described in the chapter as they relate to the use of respondents for testing statements about the role.

Chapter V summarizes the study and presents recommendations based upon it. Among these latter should be guidelines for using

the consultant and, in general terms, for improving the interaction of the local school district and various industrial organizations (in harmony with universities and other organizations) for the improvement of the educational process.

The general approach to extant theory and research will be critical; that is, these areas will be viewed in terms of their contribution to the development of an effective consultant role. In this respect close attention will be directed to the principles underlying research projects, application of technologies, examples of education-industry cooperation, and the relation expressed between research and the public schools.

Guidelines for the study are provided by the body of theory usually referred to as systems procedures or long-range educational planning, and the role of the consultant will be developed through this context.

DEFINITIONS

There should be little need for the use of unusual or esoteric vocabulary; indeed, if the project is to achieve its goals, it should clarify terms rather than add to an already crowded vocabulary. Nevertheless, as new terms are used, they will be defined in context. At this point, the following meaning is assigned to these expressions:

Consultant: Since a basic purpose of this study is to define a consultant role, it cannot be adequately explicated here. The term is intended to encompass a group of functions which depend on expertise (in this case planning expertise) and which assume a non-permanent relationship to the organization being served by the person performing these functions. Within these guidelines the roles and functions of this particular consultant will be developed through the course of the study. Note, however, that the education-industry planning consultant should not be confused with the "supervisor" or supervisory consultant roles or with product "salesmen" who are sometimes called consultants because they provide sales services.

Industry: An organization, privately or publicly owned profit or non-profit, which provides a product or a service, but which falls outside of government (or other political) boundaries will be included within the industry framework for this paper. The definition, however, excludes foundations (and other essentially charitable and service groups), universities, colleges, and other educational organizations (with the possible exception of research corporations sponsored by these institutions), and any branch of the military (or federal government). Included will be small (even one man) consulting organizations and the giant conglomerates. The focus

will be on industry only as it relates to public school educational programs.

Systems Analysis: A section of the study will be devoted to an explication of the processes and terminologies relevant to systems analysis and other planning principles, but the term should be understood as a general expression encompassing some established techniques for problem analysis and planning.

NEED AND SIGNIFANCE

The education-industry planning consultant role contributes to the mutually effective interaction of the public schools and the education industries by providing a link between these agencies through the use of planning. The role, however, has received little attention in the literature of either industry or education. Consequently, the study should prove significant to the field of education because it will define and predict new forms of interaction. The study should provide guidelines for the use of the education-industry planning consultant by local school districts, indicate problems in the use of cooperative planning techniques, and define an operational context for some kinds of industry-education relationships.

CHAPTER II

THE INDUSTRY-EDUCATION RELATIONSHIP

INTRODUCTION

This chapter presents a description of present industry-education relationships. The focus centers on the institutional format of the industry-education relationship and on some of the major forces which underlie developing relationships. Two major themes are pertinent. The first, technological implementation in education, suggests the basis for the developing industrial stance towards public education. The second, comprehensive planning, indicates a need resulting from technology and a condition for its successful application. This area will be discussed in Chapter III.

The implications of the emerging industry-education relationship are profound. Fritz Machlup, an economist, has coined a new economic category called the "knowledge industry."¹ Machlup claims that this knowledge industry eventually may claim 29% of the gross national product. Kerr has placed education in this perspective:

¹In Warren G. Bennis, Organization Development: Its Nature, Origins and Prospects (Reading, Massachusetts: Addison-Wesley, 1969), p. 25.

What the railroads did for the second half of the last century and the automobile did for the first half of this century may be done for the second half of this century by the knowledge industry: that is, it will serve as the focal point of national growth.¹

The dimensions of this increasing application of resources to education and the consequent effects on roles and functions for the public schools, including new demands for industry linkage, are only recently being recognized. Coping with these forces will become a significant task for industry and educational policy makers, but they will require specialized assistance. One role which appears viable for this purpose is the education-industry planning consultant. The role is suggested by the relationships developing because at industry's direct thrust upon the curricular and instructional aspect of education. These developments form the basis for this chapter and define the universe of the consultant's concern.

THE INDUSTRY INTEREST IN EDUCATION

American industry and education have been closely related throughout the Nation's history. Indeed, many economists see the growth of industry as directly related to the rapidly increasing literacy level achieved through a system of public education. For this reason, satisfying the needs of industry for a highly trained

¹Clark Kerr, The Uses of the University (Cambridge, Massachusetts: Harvard University Press, 1964), p. 86.

labor force (the obverse of meeting the vocational interests of individuals) has been a traditional role of the schools. On the other hand, industry has supplied the products required by the schools to build and operate the plant, including the materials and equipment for instruction. This supply function extends from plumbing fixtures to blackboards, and from wall clocks to teaching machines. School management and organization have tended to parallel industrial developments in these areas, although important modifications are necessary because of different purposes. A long tradition of interaction between industry and education has developed as a result of mutual interest and needs.

This historic relationship, however, kept clearly distinct the infringement of industry on the selection or design of the school's instructional and curricular elements. In effect, teachers told industry what kinds of teaching materials were required, and industry provided them. A similar relationship existed for other products. The process would look something like this: A teacher (or a university professor of a school subject) would sense a need for a new text (or some other material). He would write the text, perhaps illustrate it, and experiment with it on his classes. If the material seemed worthwhile, the teacher would contact a publisher and undertake to have it distributed formally. Since there is great

commercial competition for good material, the publisher may have contacted the writer first, or the publisher, sensing a need for a new text, may ask a teacher to prepare one. This latter instance is less common, however. Once the text is on the market, the publisher (industry) undertakes to manufacture, advertise, sell, and distribute the product. The writer receives payment through a royalty based on sales. Classroom teachers criticize the text, and their reorder preferences determine how long the product stays on the market.

This sketch of the traditional interaction among school teachers, writers of instructional materials, and publishers is bare-boned, but it does focus on the significant elements of the traditional relationship. Perhaps the major problem has been communication, especially from the viewpoint of the classroom teacher. Publishers generally advertise their materials through journals and at convention exhibits. Copies of texts are presented to principals and are sometimes available in district instructional materials centers. Teacher choice, however, has been limited to selecting among finished products. Only inadequate opportunities have usually existed to effect the selection of materials prior to publication. Frequently, the complaint is heard that publishers sacrifice individual and regional differences to the demands of the

mass market. Educational planning has frequently been limited by the availability of texts and other instructional materials.

From the industry point-of-view, rapid changes in teaching materials, especially expensive textbooks, limit profit potentials by increasing development and production costs. Hardcover books face stiff competition from paperbacks and from new duplicating techniques (spirit duplicators and off-set methods) which facilitate a teacher's design of her own materials. Many major curriculum projects, for example, CHEM Chemistry, PSSC Physics, and "The New Math," required planning and design funds in excess of potential profits from publication. Their development has been supported by foundations and the federal government, and publishers acted only as distribution facilitators. This kind of multi-institutional cooperation for materials development has helped promote a new look at industry's responsibility for product planning and development.¹

THE EDUCATION INDUSTRY

During the past ten years, we have seen the development of the "education industry," and it has become fashionable to speak of

¹It has also required Congress to reexamine copyright and patent laws, including the disposition of materials in the public domain. No satisfactory new law has yet been created, although the revisions have been discussed for the past five years.

"education as big business," Indeed, it is big business! Between 1957 and 1967, according to one U.S. Office of Education report, educational expenditures increased from 21 billion dollars to over 50 billion dollars. Some forecasters see the figure doubling again before 1975. Johns reports that:

Thirty-six years ago 3.1% of our GNP went into the elementary, secondary, and higher public and private education. This year (1969) 7.6% of the GNP will be so used. In 1980 I think it will be 12%. Private industry knows these facts better than anybody else. The computer industry knows them. And to a considerable extent the aims of education are now being determined by IBM, Burroughs, and others; that is, we are getting the kinds of schooling that can be computerized, that can be conveyed in the software they can sell, by educational television, and so on. These industrialists are not politically responsible in the way our representatives and senators and board of education are. They are interested primarily in profit. Book companies and other organizations are allying with the electronics industries. I am concerned about these industrial combines taking over from teachers, and also from the politicians, because they can make money out of education and not be responsible to anybody.¹

The size of the market does not adequately describe this new growth industry, which represents a radical change in the education-industry relationship. As will be developed in this chapter, it indicates a positive thrust by industry on the planning and production of curriculum and instructional programs and a transfer of industrial (and to a large extent, military) education and training experience

¹Educational Planning in the United States (Second Symposium on Educational Requirements for the 1970's, An Interdisciplinary Approach), Stanley Elam and Gordon I. Swanson, eds., (Itasca, Illinois: F.E. Peacock, 1969), p. 34.

to the problems of the public schools, a transfer which includes both new educational processes as well as new gadgets and materials.

Before discussing these ideas, it may be helpful first to indicate some of the major industrial groups comprising the education industry:

The Educational Conglomerates

During the past ten years, a number of large corporations have merged separate companies to form broad-based organizations dedicated to the field of education. These "educational conglomerates" provide under a single management the capability for designing and producing a complete educational "package," including instructional materials, facilities and equipment, teaching machines and programs, perhaps teacher training and instructional management. One leading example of these mergers is the General Learning Corporation. It was formed jointly by General Electric and Time, Inc. Through its creation systems planning resources and computer capabilities from General Electric were merged with the creative production and publishing facilities of Time, Inc. The Silver Burdett Company, a textbook publisher, was later added to the group. General Learning's management then organized divisions concerned with educational planning, curriculum and course design, and research and development.

The effect appears to be the development of an industrial group which can focus the efforts of diverse companies on problems of education for the public schools, the military, institutions of higher education, and other industries.¹

Several other conglomerates have been created in a similar manner. RCA established an educational division which focused its many technologies--computers, television, audio-visual aids--on educational applications. The division includes the RCA Institutes and electronics training school, and has successfully operated training and educational programs under federal programs such as Job Corps. RCA has acquired Random House for publishing support to this division. Xerox Corporation combined Basic Systems (an educational planning company), University Microfilms, and American Education Publications. In so doing, it united hardware (machine) and software (texts and microfilms) capabilities with a strong educational planning and design group. Three major elements seem to govern the development of these conglomerates: a capability in a major electronic system with potential educational applications, a strong

¹See Charles E. Silberman, "Technology is Knocking at the Schoolhouse Door," Fortune, August 1966, and J. Sterling Livingston, "Present Posture of the Education Technology Industry," Proceedings of the Engineering Systems for Education and Training Conference, Arlington, Virginia: National Security Industrial Association, June 14-15, 1966.

and highly respected tradition in educational publishing, and a specific emphasis on the use of systems analysis and other planning techniques developed by the military-industrial interests.

Computer Software Firms

Computer software firms develop the programs which instruct and control the machine. They spring up like wildflowers, usually in response to some programming design problem, but some have been in business since the early 1950's. Unless it was created in response to a specific educational application, these firms seldom see educational programming (both programmed instruction materials and computer programs) as their primary business, but they often find strong secondary markets in training and education. These markets have been primarily military and industrial, but some direct applications to public education have been attempted. Usually, the software firm requires planning, marketing, and research expertise beyond its basic structure before it enters the education field. This factor limits its ability to compete with the conglomerate, which group rapidly "buys up" small firms with good ideas.

Research and Development Firms

There are essentially three types of firms in this category: the profit research firm, the non-profit research firm, and the

university connected (or sponsored) research foundation. Actually, the differences reflect business and legal procedures but have very little effect on function. The oldest organization of this kind is the RAND Corporation which was established as an Air Force "think tank" during World War II and became the prototype for many other groups. RAND emphasizes the use of the interdisciplinary team to design original, and sometimes unique, solutions to problems. Originally limited to Air Force (later military) questions, RAND has broadened its interests to include major social problems including education. As with most R&D firms it does no manufacturing of products based on its studies, and it tends to remain fairly small.¹

Other organizations, for example, the Stanford Research Institute, were organized by groups of professors or by a university as devices for the management of R&D projects. They provide a mechanism for receiving government funds, hiring research personnel and purchasing research equipment, while freeing professors from the usually constraining regulations of the university. Several of these arrangements have come under attack recently because they were seen as connecting the university with the Department of Defense, but there seems to be a trend for these groups to separate from their

¹William Leavitt, "RAND: The Air Force's Original 'Think-Tank,'" Air Force/Space Digest, May 1967, pp.100-109.

sponsoring university anyway. A scholar may teach for a college and work for an R&D group, but one job will be part-time and distinct from the other.

These groups are funded through the contract research procedures developed by the federal government.¹ The process works as follows: A government agency (or some other organization) determines that it needs research or development assistance with a problem. (Sometimes it wants help discovering what its problems are.) An "RFF," (request for proposal), is published, and bids are requested from all interested concerns. Each R&D firm designs a proposal in response to the statement of the problem. The best proposal is selected on the basis of quality and cost, and a contract is awarded to the successful firm. The research and development work is then undertaken in terms of the provisions of the contract.

In the field of education, the contract research and development process has been implemented by the U.S. Office of Education, the Department of Defense, the National Science Foundation, the National Institutes of Health, and the Office of Economic Opportunity. During the past decade emphasis has been placed on curriculum improvement projects, applications of technology to education, the

¹Information for potential contractors is available from the Government Services Administration. Most agencies maintain a contract office which will provide information to potential bidders.

development of evaluation and dissemination procedures, the design and implementation of teacher training and differential staffing programs, and the development and design of planning functions.

The contract research procedure has been both vehemently condemned and broadly hailed as a method for funding research and development. Much important development work in education owes its existence to the availability of such funding through the federal government and the major foundations,¹ but changing priorities and insecure funding have frequently prevented completing long-range projects. Translating the results of these efforts into viable, ongoing programs within the public schools, however, has remained a significant difficulty.

Planning and Management Consulting Firms

Business and industry show indications of a well-established tradition of using outside assistance for the solution of management problems and for acquiring expertise on a temporary basis when it is more efficient than permanently hiring personnel. Education, on the other hand, seems to have resisted this technique until recently. The primary impetus for education's use of consultants appears to

¹The foundation's role is coming under serious scrutiny by the Congress. Their viewpoint is well stated by Alan Pifer, "Foundations and the Unity of Charitable Organizations," Annual Report for 1969. (New York: Carnegie Corporation, 1969), pp 3-14.

stem from three reasons: new planning and management developments outside the field are having a direct effect on the operation of the schools (especially through legislative requirements for project management and evaluation); the field of education is not producing capable and competent managers fast enough or in large enough quantity to start the organization at all its levels; and, there is growing recognition that hiring consultants can result in cost efficiencies.

Consultants are usually employed on a contractual basis by a school district or other educational agency. Some firms, such as A.D. Little, provide a broad range of services to clients from industry, education and other branches of government. Other firms specialize in working with educational institutions on problems of management, planning, curriculum design, or training. Many small firms deal with a single aspect of the educational field, such as long-range planning, technological applications, or cost accounting. These consultants usually possess some special expertise as a result of a wide range of experience with both educational and industrial organizations. They can make strong contributions to program development when effectively used.

This brief description may serve to clarify the organizational changes in response to education's needs for specialized products and

services. The reader, undoubtedly, will be familiar with at least one firm which falls outside this elementary classification, but all industry organizations seem to share one or more of these characteristics: (1) they are concerned with making a profit, hence, they operate on a cost-effective budget (unlike the schools which must keep trying to do some jobs without adequate resources or at the whim of taxpayers); (2) they are concerned with broad-based statements of problems and major improvements in the processes of education; (3) they represent specialized sources of knowledge about new techniques, new technologies, and recent developments from fields outside of education (usually the military and industry); (4) they are interested in service to education and are generally supportive of the public schools, although both the need for radical changes and for alternative structures are acknowledged; (5) they have represented a threat to many schoolmen who see these new groups as challenging the "professional" expertise of the educator; and (6) they are concerned with results, i.e., learning achievement resulting from effectively designed programs.

SOME BACKGROUND CONCERNS

Through a complex system of organizations, the education industry has established itself as big business. For the purposes of this paper, the mechanics of these business changes are less

significant than the forces which cause them and which, although partly historical, indicate future directions. Before discussing the present relationship between education and industry a discussion of these forces may provide a perspective for contrasting several approaches to the education-industry relationship.

Federal Dollars for Education

The National Defense Education Act of 1958, (NDEA), and the Elementary and Secondary Education Act of 1965, (ESEA), are landmark pieces of legislation so far as industry's increasing role in education is concerned. The NDEA opened the door for the mass acquisition by schools of equipment and supplies for the improvement of instruction. It also funded teacher training institutes, so that familiarity with new techniques and technological advances became commonplace. Titles I, II, and III of ESEA provided additional funds for instructional gadgetry and materials, although Title II was limited to library resources, and Title I funds were designated for underprivileged groups.¹

¹Charles S. Benson and James W. Gurhrie, An Essay on Federal Incentives and Local and State Educational Initiative. (Berkeley: The University of California, December 1968). In this and future references throughout the study some areas are synthesized from various materials including particularly the source referenced by the footnote.

Perhaps Title III, of ESEA 1965, more than any other single legislative title, stimulated the new relationship between industry and the schools. This title provided funds for the implementation of innovative solutions to significant and persistent educational problems. Under this title experiments were encouraged with instructional television, computer-assisted instruction, dial-access equipment, new forms of language laboratories, and a whole host of self-instructional devices. One significant intent of this act was to encourage the application of technology within the framework of the schools. To insure effective operation, the contract research procedures were implemented, and school districts found themselves competing for federal funds. It soon became clear that most school districts did not have the resources to develop plans for using these new technologies. The developers and suppliers--the emerging educational industry--had to help school districts design the use of their wares. At this point, it may be suggested begins the redefinition of the industry-education relationship in the areas of curriculum and instruction.

Working as consultants, manufacturers' representatives helped local districts plan and develop proposals under Title III. Other resources found their way to the local district, including representatives of R&D groups, non-profit research firms, and independent

education planning consultants. These new resources provided an exciting impetus to educational change, but they have also resulted in some difficult problems for the unwary district. First, it may be stated almost as an axiom that the closer the relationship between the consultant and a specific product, the more the problem was stated in relation to the product's ability to solve it. Second, spurred by ready funds, many implementations were attempted before the product had been sufficiently developed for use in the public schools or the schools had been prepared to receive it. Third, much Title III planning was narrow-gauged; that is, it assumed a change in part of the system would affect the entire system. Instead, these piecemeal modifications were often rendered innocuous by the inertia of the school system. Many potential, productive implementations failed through lack of broad system planning.¹

Requirements for Technological Planning

The legislative mandate which provoked the restructuring of industry's concern for education should not be viewed merely as an attempt to thwart the public schools. Indeed, such an intention

¹These developments are reported in Notes and Working Papers Concerning the Administration of Programs Authorized Under Title III of Public Law 89-10, The Elementary and Secondary Education Act of 1965 as Amended by Public Law 89-750 (Richard I. Miller, Study Director), Subcommittee on Education, Committee on Labor and Public Welfare, U.S. Senate, (Washington, D.C.: Committee Print, April 1967).

would be difficult to justify as a significant political motivation for legislative action. Nevertheless, the very active lobbying forces of the electronics, computer, and publishing industries certainly helped to focus Congressional interest on their potential contributions to education. It is useful to explore a few of industry's reasons for finding a federal mandate desirable.

The first reason is money! Technological planning and implementation are expensive and seem to require an economic universe larger than the average school district. The most available source of large funding, which could also be freest of immediate political control, appeared to be the federal government. During 1964 and 1965 the Congress was struggling to develop appropriate legislation to deal with major social issues--education, poverty, unemployment. Some technological systems developed by industry could be justified as potential solutions to social and educational problems. All that seemed lacking were funds for development and implementation. Indeed, some school systems expressed a strong willingness to work with industry, so long as additional money could be found without raising local taxes. The federal government, therefore, through its development of new social legislation, became the catalyst for bringing together the schools and the developing education industry.

A second reason, and historically a highly significant one, has been industry's continuing interest in finding new markets for existing products. Since World War II the Department of Defense has invested huge sums for the development of technology-based training programs. Among the significant end-products of these activities have been the language laboratory, both the principles for constructing and a wide variety of completed programmed instruction courses (including many in the common core learning areas), a wide variety of teaching machines, instructional films (and greatly improved techniques for their development), a vast amount of experimentation with applications of the computer to training problems (including training simulation), and a wealth of psychological insights and design data. It seemed reasonable to assume that the public schools should offer a ready market for these items or for new products derived from this research.

The market was ready-made, especially after the first NDEA Act was passed in 1958. Programmed texts, language laboratories, teaching machines, and a host of sophisticated electronic equipment for scientific experimentation were frequently oversold to the public schools. Purchases sometimes far exceeded either instructional requirements or the ability of classroom teachers to use the new gadgetry effectively. Much of this bonanza has been left

in shelves to collect dust. One frequent result, unfortunately, has been a group of disillusioned and distrustful educators who have come to confront industry defensively and doubtfully. But industry learned this "oversell" lesson well, and now a significant concern of the industry is that one company will "rush the market" with a new development and thereby discredit the whole group.

A third reason should be mentioned, which might be called a sense of future direction. Despite the Viet Nam War, a clearly discernable mandate had been evolving for massive government action to deal with the great social injustices within the American culture. The Economic Opportunity Act (1964) and the Elementary and Secondary Education Act (1965) were thought to be only the initial steps for attacking social ills. This trend was reinforced by increasing education and training needed by the sophisticated demands of technological employment within a science-oriented and rapidly changing culture. Education was clearly the growth area for the decades ahead, and industry was "gearing up" to meet the challenge.

Not five years later, a pattern of federal cut-back in the "people areas," and the general increase in both military spending and inflationary levels (caused by the waste of war) seem to have

dimmed this bright promise of a nation devoted to education. The position of the education industry must be viewed in two ways. American industry, acting in the tradition which has gained it world leadership, predicted a major social trend (i.e., a potential market) and prepared to meet it. On the other hand, industry rode a well-defined wave, and when it crested, the industry found itself internally conflicted (lacking a clear sense of purpose and direction) and externally thwarted (lacking a financial and collaborative relationship).

New Psychologies and Approaches to Learning

Two developments in the field of psychology have affected industry's changing relationship to education. The first of these, "behaviorism," led to the development of a "learning system." The second change concerns a radical shift in opinion about intellectual development, especially of the young child. These two areas are not necessarily related historically, but they are fused in the design of technological applications to learning problems.

Behavioristic psychology implies that the goals of learning can be stated and that appropriate experiences for achieving these goals

can be logically ordered. The learner, having understood the goals, will be rewarded for correct responses (those leading towards the goals). Basic to the organization of learning experiences is their division and subdivision into a series of steps manageable by the individual learner. If the learner fails to achieve the goals, the system must be redesigned until it works. Responsibility for learning is shifted to the teacher for failing to organize learning experiments appropriately. The system fails, not the student!

This quick sketch describes the basic concepts underlying the design of programmed instruction and many computer assisted instruction (CAI) programs. Both are fairly straightforward examples of learning systems. A learning system is developed by following a set of step-by-step procedures which usually include the following:

1. Prepare the learning objective.
2. Sequence the objectives (in the presumed logical learning order).
3. Identify the required learning activities (steps to achieve the objectives).
4. Select the learning components and procedures (teaching strategies and materials).
5. Analyze the cost-effectiveness (or reasonableness of selecting one alternative over others).
6. Coordinate the components and procedures.
7. Evaluate the performance of the learning system.

8. Redesign the system as required by experience with it.¹

Although this procedure resembles an outline for any curriculum design process, the learning system requires the careful definition of goals whose achievement can be measured. For some kinds of school learning, this measurement of learning is a simple matter. Clearly, if the student responds with 4, it may be assumed that he has learned the answer to $2 + 2 = \_$. On the other hand, it is perhaps impossible to write a measurable learning objective for determining a student's understanding of "beauty." This kind of problem has caused a heated debate over the usefulness and appropriateness of behavioral objectives for public school education, but the success recorded by such researchers as Hoome,² Gagné,³ and Skinner⁴ has established the learning system as potentially useful for problems of public school education.

¹Robert G. Smith, Jr., The Design of Instructional Systems (Alexandria, Virginia: The George Washington University, HUMRRO (AD 644 054), November 1966.)

²Lloyd Homme, Contingency Management and "A Behavioral Technology Exists--Here and Now," (Albuquerque, New Mexico: Westinghouse Research Laboratory, 1967).

³Robert Gagné, editor and contributor, Psychological Principles in System Design (New York: Holt, Rinehart, and Winston, 1965).

⁴B.F. Skinner, The Technology of Teaching (New York: Appleton-Century-Croft, 1968).

The second radical change in psychology concerns the reinterpretation of intellectual development and stems from the work of Piaget, Bruner, and Hunt, among others.¹ It had been assumed traditionally that the child's intellectual development was a "fixed" process requiring various levels of maturation occurring at appropriate chronological ages and not influenced by education and training. The focus of early education, therefore, has been placed on the child's social and emotional development. The child learned group skills and various cultural-based attitudes during the early years. Research by the persons indicated above lead to a radical re-evaluation of intellectual development. It could be shown that quite respectable levels of intellectual development could be achieved even by very young children, using carefully designed learning systems (and other aspects of behavioristic psychology). Two and three year olds could be taught to read, to write, and to perform basic arithmetic skills. And further, it was believed that intellectual training could compensate for environmental defects resulting from poverty, home conditions, or other conditions inhibiting later educational development.

¹J. McVicker Hunt, "The Psychological Basis for Using Pre-School Enrichment as an Antidote for Cultural Deprivation," Pre-School Education Today Fred M. Hechinger, ed., (Garden City, New York: Doublday, 1966).

During the 1940's and 1950's the Armed Services and some major industries developed the concept of the learning system and found it an extremely effective method for designing training programs. During this same period the school seemed to ignore this methodology or condemned it as dehumanizing, using the presumed nature of child development as a major defense. The change in thinking about intellectual development dovetailed with the learning system designed with behavioral principals because through application of such precise planning children were learning quite complex intellectual skills. Industry, having been prepared to accept this occurrence because of its research (albeit primarily for the military), exercised greater initial flexibility than educators who had accepted conflicting doctrines.

The leadership for change, therefore, came first from a combination of non-educational psychologists (most with military training experience) and engineers who were designing and building the equipment.

The Faith in the Schools Issue

"Texas school administrators were told that declining caliber of public education may produce schools operated by large business corporations" begins a newspaper report in 1967.¹ In one sense,

¹Houston Chronicle, January 6, 1967.

this article continues the criticism of the public schools which was rampant in the fifties and only partly ameliorated by the reform movements of the sixties. On the other hand, it predicts the present situation, because industry is beginning to be viewed as both a working partner with the schools and as a viable alternative for achieving specified educational goals.

There are great strengths in the present organization and structure of American public education, but the pre-technological framework represented by the schools has not yet provided an adequate environment for the implementation of new and potentially effective technologies. Indeed, the organizational structure, institutionalized professionalism and labor-intensive economics, financial levels and governmental concern, and philosophical outlook of the schools are most frequently in conflict with the advances in technology occurring outside of the schools. Releasing the power of new instructional formats based on technological advances usually requires radical structural changes in the schools, and this condition has so far resolved itself in favor of maintaining the status quo.¹

¹W.P. Kent, Walt Le Baron and Robert Peterson. Feasibility of Using an Experimental Laboratory for Identifying Multi-Media Problems and Requirements (Falls Church, Virginia: System Development Corporation, June 1968) Final Report, USOE Contract OEC-1-7-071143-4419. See also, Commission on Industrial Technology, To Improve Learning A Report to the President and the Congress, (Washington, D.C.: The Commission, August 1969).

The following figure, designed for this study, highlights distinctions between the industrial and educational communities:

FIGURE 1

THE SCHOOL AND INDUSTRY APPROACH EDUCATION
IN VERY DIFFERENT WAYS

Industry thinks about educational problems based on the deliberate predication of needed.

SYSTEMS ANALYSIS

It developed new techniques for meeting these problems.

P/I	CAI	EVT/ITV ¹
NEW EDUCATIONAL TECHNOLOGIES		

It added industrial standards of management efficiency.

PLANNING-PROGRAMING-BUDGETING SYSTEM
MODERN MANAGEMENT

It announced a new solution for old and ingrained problems.

THE EDUCATIONAL PACKAGE

It looked for further applications of its developments.

MARKETING/SALES

The schools evolved from a poorly defined consensus to be all things to all people.

INSTITUTIONAL CHARTER

Piecemeal additions met new needs, promised better results.

THE "ADD-ON" PROCESS OF
EDUCATIONAL CHANGE

Tight budget and political pressures bred caution.

SCHOOL ADMINISTRATION

The schools just couldn't keep up with new demands for quality and quantity.

THE EDUCATIONAL LAG

It looked for new ways to do the job.

EDUCATIONAL RESEARCH

¹P/I: Programmed instruction; CAI: Computer assisted instruction; EVT/ITV: Educational/Instructional television.

Does the American public have faith in its public schools? Evidence has been accumulated in many directions. It is clear, however, that the traditional structure of public education is changing radically as a result of public pressures and political decisions, and these changes involve industry more directly in the process and management of education. The Economic Opportunity Act of 1964 established two highly significant programs of education outside of the public schools. The Job Corp, a vocational training program, was operated by industries through the contract procurement procedure.

The same act also established the Head Start program outside of the public schools, although a number of schools chose to cooperate with the local Office of Economic Opportunity agency responsible for its operation. One strong motivation for the separate educational operation was the feeling by some that the schools were incapable of dealing with the special problems of the Head Start population because of the extant philosophical and psychological orientation towards early childhood education and because the school seemed to have drifted away from the community Head Start was designed to serve.

This structural distinction provided an unsatisfactory explanation for problems in dealing with deviant populations.

The search for alternatives to public schools has continued, and industry has found itself playing an increasingly important role in the process. Community schools, store front learning centers, tutorial programs, and many other formats are being explored. Many of these experiments use the learning systems and some of the technological advances developed by industry. Two examples are useful for tracing these developments.

Westinghouse Learning Corporation established a Learning Center in Albuquerque, New Mexico. The Center serves many problem groups, among them under-achieving junior high school students. For these students the Center contracts with the parents to increase the child's grade level in reading or arithmetic for a fixed fee. The child may attend the Center until the objectives are achieved. If the child fails to achieve and clearly won't respond to the Center's program, the parent pays nothing. How does it work? The Center's activities are organized around the psychology of "contingency management." In brief, this theory states that the high expectancy behavior can be used to motivate the low expectancy behavior. As Lloyd Hoome, one of the Center's founders, explains, "When a mother tells her child to finish her spinach before she can have dessert,

she is applying the basic concept of contingency management." There is a low probability that the child will eat the spinach but a high probability that the child will eat the dessert. The latter activity, therefore, is made contingent on satisfactory completion of the former. In this way, the child sees some reason for completing the unpleasant task of eating the spinach.¹

At the Center the unpleasant task for an underachiever may be reading, and a pleasant task may be playing pool. The student, in cooperation with the teacher, makes a contract to learn a particular reading skill or complete some other task. He works on his own, but the teacher can be asked for help. The student's reward for completing the task will be a designated amount of time free, in the game room, to play pool. Through the application of this process many non-readers have become avid fans of the printed word.

The Center employs a teacher (but not a certified classroom teacher) and a para-professional to work with classes of approximately ten students. Over \$10,000 worth of books, learning machines, exercise sheets, and related materials are available to the class. A separate room contains the play center which is well equipped with games and activities having high appeal for the age group.

¹These ideas were received during a conversation with Dr. Donald Tosti, Director, Dr. Lloyd Homme, Chief Research Psychologist, and Barbara Salazar, Learning Center teacher, at the Westinghouse Research Center, Albuquerque, New Mexico, November 1968.

Once the student has set a contract obligation expressing his learning goals, he moves freely about the classroom. Discipline problems are missing because the student is working to achieve a goal he helped set. Once he has done so, he can move freely to the play room. Indeed, the environment and atmosphere are quite unlike the ordinary classroom!

Two aspects of this example require attention. First, a great deal of planning both the organization and the materials of study preceded the introduction of students to the process. The behavioristic psychology of contingency management was carefully defined and applied to the specific situation. This researcher found the Center to be a well-designed, highly operational learning environment. The second point is close to home. The Center's director showed little willingness to discuss per pupil cost, and only rarely has a public school operated under these conditions or with such low student-teacher ratios. For these reasons, comparisons between the Center and any school experience are exceedingly difficult. Again, despite this prior planning, any student at the Center made a positive decision to attend! He, or his parent, could also choose not to attend. Such positive pre-choice is equally unavailable in the public schools.

Why would an industry undertake such a project as the design and operation of a learning center? In part this particular center was motivated by the Corporation's research and development interests. Despite these concerns the Company believed it could offer a learning program to students presently failing public schools, and it could do it at a profit. In this respect the Corporation places itself in direct competition with the schools, but it limits its educational concerns to carefully defined goals.

The success of this and related projects by various industries has provoked the use of "performance contracting" by the U.S. Office of Education. Under this arrangement, a contractor agrees to achieve predetermined learning goals (e.g., raising a student's reading level by two grades) within a specified length of time and at a stated cost. Failure to achieve the goals within the specified time results in a loss of payment. A contractor may spend more or less than he charges in order to achieve the goals. The first performance contract has been awarded to the Dorsett Educational System Co., Norman, Oklahoma, through the Texarkana School System, from funds provided by Title VIII, ESEA (dropout prevention). Under the terms of the contract, "if the company can raise the reading and mathematics level of students who need the most help...by one full grade in 80 hours, it will receive

\$100 per hour per student. If the job takes 105 hours or more, payment is reduced to \$60 per student."¹ Much criticism of this plan has already been voiced, but as Lessinger states in Nation's Schools:

If schools are to be held accountable for results, a new approach to the basic mission of the schools is necessary. First, the focus must shift from teaching to learning. Second, a technology of instruction based on specific learning objectives will start to build. Finally, a rational relationship may be established between costs and benefits.²

Some Specific Educational Technologies

This section will discuss three of the technological areas which have drawn industry and education into new relationships. The emphasis in these discussions will be on the processes involved and the relation of the gadgetry to these processes.³

¹"Private Firms Win Performance Contract: If Students Don't Learn, District Doesn't Pay," Phi Delta Kappan, November 1969, p. 135, see also Leon M. Lessinger and Dwight H. Allen, "Performance Proposals for Educational Funding: A New Approach to Federal Resource Allocation," ibid., pp. 136-137.

²Leon M. Lessinger, "After Texarkana, What?" Nation's Schools, 84 (December 1969), pp. 37-40; the RFP was published in Educational Technology, August 1969, pp. 5-9.

³Robert Heinich, "Technology of Instruction: Impetus or Impasse," in Planning for Effective Utilization of Technology in Education, Edgar L. Morphet and David L. Jesser, eds., (Denver: Designing Education for the Future, 1968), p. 81.

who, ultimately, may choose what to study, when and how long to study, how to receive information and assistance, and which factors determine, according to his individuality, success. The relation of the teacher to this process will be minimal insofar as the routine cognitive processes are concerned, but the implications for the development of human relations and creative interaction direct that the teacher's role will be an important one as the student's control of the routine elements increases.

Technology has replaced various teaching functions. -- The teacher's need to drill students can be virtually eliminated, at first slowly by workbooks (which need correcting) and then rapidly by teaching machines (which can choose the type and conditions of drill). To a large extent movies and television recordings can replace the teacher's "information presentation" function, and various devices can stimulate the question-answer procedure. With automatic test scoring, mark compilation, and attendance keeping, a large percentage of the teacher's traditional activities may be automated. This release of the teacher for productive, creative human activity seems to emerge as the significant contribution of technology to education.

climate control on learning appear to be only poorly explored at this time. Once effective combinations of light, heat, and humidity are established according to the variety of learning and the student's individual requirements, the variable conditions could be created in the school.

Another level of control provided by the new technology involves the organization and presentation of stimulæ in orders assumed appropriate for specific learnings. Programmed texts achieved breakthroughs in this area, and the new capabilities of the computer to branch according to the needs of individual students suggests that individualized instruction for every student may become possible within the near future. The teacher would become the selector of appropriate materials and the guide for the student's development. The learning function is shared by the student and the technological system.

Technology has increased control of the learning environment by the student. -- Recent developments such as the programmed text and the teaching machine, dial access, the computer, and response systems give the individual student new opportunities to control the rate, selection, and the direction of his learning. Branched programming techniques and computer guidance and record keeping can provide an individual program tailored for the particular student,

obviating of economic disadvantage). The advance of technology has increased this aspect of the educational function, and the new technologies have once again moved beyond the realm of the classroom world.

Technology has increased control of the learning environment by the teacher. -- Although it is suggested by item two that the teacher is losing control through expansion, the technologies are also increasing the deliberate variations achievable in the learning environment. Such commonplace matters as adequate ventilation and lighting (and instant changes in light and sound levels) should not be underestimated. Schools can now create an ideal climate for each activity. Shades are pulled and lights shut off for movies in one room while noise is kept in and out by sound baffle walls. Students switch the light on under the microscope, no longer crowding around the window on a sunny day. Various arrangements of electronically controlled apparatus have been designed to make available in the individual classroom the resources of electronic storage and reproduction, enlarged display of any image, and instant copying of materials needed in mass quantities. In a somewhat imaginative vein, Buckminster Fuller's geodesic dome could make possible a school in which climate is so well controlled that the tropics may be simulated or the arctic experienced directly. The implications of

When discussing technology, however, we are forced to consider how the advancing technology is affecting educational functions.

Implications of Advancing Technology

Technology aids the teacher in the performance of a specific function by extending the teacher's time and place.--Blackboards increased the time limits of a teacher's utterances, made visual display possible. Dial-access systems and television perform this same function. In short, one value of technology has been the increase in the range of a teacher's effect. A first use of the electronic technology was a natural development of greater ranges for the teacher's effect, but at a certain point the technology became a block to the immediate participation of the learner with the teacher. At this point, the technology is no longer assisting, but competing with, the teacher.

Technology has expanded the learning environment.--Access to sound and visual images, by either mechanical or electronic means has increased the number and the range of images and experiences which are available in the learning environment. In fact, the choices now available to teachers are so great that careful selection and adequate utilization are more serious pedagogical problems than the procurement of experience; (This statement assumes, of course, the

These shifts, from use to design, from machine to procedure, from the casual to the basic, are causing the greatest problems for proponents of technology. The implications of this discussion seem clear. Technology has not permeated the 2 x 4 x 6 classroom, nor the traditional system of education, to the degree required for its acceptance as a viable part of the learning environment. As McLuhan suggests, we are living in the linear, bookbound past, using limited sensory resources, and deliberately confining our thoughts about education to the schoolhouse. The first need for the new technologies becomes a view of them as serious purveyors of information and insight. The result may be a new view of education as a human function, supported by a psychology which is appropriate for image perception, and operative within an educational system that evolved from this new view and this new psychology.

The early technological devices were designed to assist the teacher in her tasks, but she was always in control of the educational process. These developments did not question the role or the functions of the teachers, but as "total learning systems" are designed, making it possible to replace the teacher entirely, the place of the teacher in the system becomes the overriding problem. Yet only a minimum of attention has been devoted to the restructuring of the teacher's role in terms of changing organization of functions.

Two changes in technology must be recognized as they affect the structure of education. First, technology has changed from mechanical to electronic. Second, technology has changed from non-systematic to systematic; that is, the effective interrelationship of all the parts is critical to the operation of any of the parts within the system. Previous technological advances, such as movie projectors, radios, etc., could be incorporated into the available on-going system. Not so the computer! This electronic, system technology, at its inception and as a requirement of its appropriate application, causes radical alterations of both ways of thinking and acting.

Heinich discusses the nature of this technologic process as it is presently perceived for education:

A fundamental principle of general technology shifts emphasis from the use of a tool to the design of the tool. The sophistication of technology is directly related to the number of decisions that are made in the design stages, and many modifications in design decisions made at the time of use must be justified. However, education is now structured so that emphasis is placed on use rather than on design. Instructional management arrangements, professional training and budgetary allocations are based on the assumption that not enough instruction contingencies can be specified sufficiently far ahead to make advance design possible . . . Instructional technology, however, allows identification of these tasks which can be taken care of by carefully designed mediated instruction. Placing the focal point of instructional strategy at the curriculum planning level moves us in the direction of emphasizing design rather than use when mediated instruction is assigned responsibility for specific student behaviors.

Technology makes possible the organization, storage, and retrieval of information beyond the needs of the teacher-learner situation. -- Especially significant for education is the profile of the individual student which can be developed and the comparison of this profile with innumerable (potentially) standardizable facts. An educational program could be tailored to quite precise qualifications with this capability provided by the computer's storage and access functions. Simulated factors may allow relatively accurate selection of careers at any early age. Already, simulated futures of individual students are indicating the desirability of various alternatives at the elementary level. The guidance function will be revolutionized by the memory power of the computer. The implications for the teacher in this situation are severe. Decisions formerly based on a low amount of specific information and a high degree of personal insight will now require judgements based on large amounts of information and a different kind of decision power. The heuristic capabilities of the computer require exploration as aids to the control of information in the pedagogical environment and the selection of reasonable alternatives.

Technological systems can replace the teacher, and accomplish training faster and more completely than the human system.-- Essentially, once a function can be objectified and reduced to

routine, it may be programmed for an appropriate technological system. Many training programs have been appropriately subjected to such analysis; so has much of what happens in the classroom. The eventual replacement of the teacher might occur, however, only if education is seen as totally objectifiable, a situation difficult to imagine and clearly unpleasant to predict, but a critical need for the profession will be to determine clearly what actions require the unique capabilities of the human teacher.

Within the framework of these functions and given the resolution of present uncertainties, technologies are viewed as holding promise for the following kinds of advantages when properly implemented:

- Improved use of the nation's limited educational resources.
- Increase in student-teacher ratios without a lessening in the quality of education.
- Relief from the tedium which marks many traditional classroom patterns.
- Increased student involvement in the design and control of the learning situation, and increased active participation in and responsibility for learning.
- Improvement in the dissemination of quality education, the updating of needed skills, and the provision of educational opportunities for populations of increasing size, variety, and dispersion.

It is clear, however, that technology will significantly improve education only to the degree that its total impact has been

perceived and planned for. The effective design of technology uses, however, appears to depend on an understanding of the role and functions of teaching.

THE COMPUTER

A computer is simply a machine for storing data and for performing certain basic mathematical and logical operations on stored data. Its chief advantages seem to be huge data storage capacities and almost instantaneous calculations. Through the process called "programming" computers can be "trained" to perform an amazing array of tasks, including many related to education. Some special programming "languages" now permit communicating with the computer by using ordinary English, and this development has led to broad instructional experimentation.

Computers have been applied to three areas of education: administration (in general, the business and management functions of the school), research (especially for data storage and statistical calculation), and, instruction.¹ This last area is of particular concern, and three classroom applications of the computer will be mentioned.

¹Educational uses of the computer are annotated and summarized in Don O. Bashnell and Dwight D. Allen, The Computer in American Education (New York: Wiley, 1967); Ralph W. Gerard, ed., Computers and Education (New York: McGraw-Hill, 1967); and Andrew R. Molnar and Beverly Sherman, U.S. Office of Education Support of Computer Activities (Washington, D.C.: Government Printing Office FS 5.212. 12044, 1969).

An instructional management system involves the organizing of pertinent information so a teacher's decisions can be based on analyses of student behavior and learning needs. Since the computer stores information, making it available to a teacher as needed, the kinds and amounts of information teachers require for instructional decisions have become critical questions. Where formerly, if the teacher acted by hunch and intuition, it could have been because information was either not available or could not be organized fast enough. An effective instructional management system now makes possible the design of teaching strategies based on complete and rapidly available information about the learning situation. An effectively implemented, computer-based, instructional management system can provide the teacher with immediate results of student performance. With this kind of "feedback" the teacher can adjust her relationship to each student in terms of his prior performance and learning needs.

A related technological advancement is called the student response system.¹ In a specially designed classroom each student is equipped with five buttons. At the request of the teacher the student can press one of these buttons to indicate an answer to a multiple

¹E.L. Rivest, Instrumentation Systems for Group Instruction (Schenectady, New York: General Electric R&D Center Rep No. 67-C-300 . July 1967).

choice question or a true or false question. The teacher's desk is equipped with a display of lights which can indicate each individual student response and/or the group's responses to each question. Student response systems have been connected to computers which record individual students' learning profiles and perform statistical calculations. A student response system provides a means for immediate feedback in the learning situation and for immediate testing of student comprehension. A teacher, feeling that his presentation is not being adequately received, may ask simply "Do you understand me?" Each student could press a "yes" or "no" button and the teacher, by reading the lights displayed on her desk would know both which students understood or did not understand and which percentage fit each category. In this way a presentation can be modified almost instantaneously. The advantages of using an electronic system seem to be twofold: First, the system can preserve student anonymity so that only the teacher knows how each student is answering. Second, the system provides for the storing and measuring of responses. Cumulative student records can be developed and adjustments in the learning environment can be made as a result of actual experience.

The drill and practice mode has been the most successful computer application to the instructional process. In this mode a

teacher presents the basic concepts and learnings, and each student performs a series of practice drills at the computer console. Programs have been developed for the teaching of basic arithmetic and basic reading skills. Computer terminals may be placed either in the classroom or at some other convenient location in the school. Most practice drills take about ten minutes.

The material for the drill and practice mode has been carefully organized and sequenced to meet the needs of each learner. When a student makes a mistake, he can be sequenced to an easier exercise or to practice with concepts which precede the present level. If he is successful in the initial exercise, he is sequenced to more difficult problems using the same concept and then to practice with new concepts. Unlike the traditional workbook each individual's needs can be met through many alternative drill and practice sequences.

At the end of each drill session the student receives a record of his achievement. Each student profile is stored by the computer and can be used by the teacher to adjust the learning environment. This computer mode implies a close relationship between the use of the computer for drill and practice and the use of the "live" teacher to present concepts and to develop principles. The functions assigned to the machine have been carefully related to effective roles for the teacher.¹

¹Richard C. Atkinson and Patrick Suppes, Program in Computer-Assisted Instruction. Final Report (Stanford, California: Stanford University, 1968 ERIC Document ED 026 893).

The development of simulations and games for education in the grades has been wide-spread through the 1960's and represents an extension of the war games and management simulations developed earlier by industry and the military. Many games do not use computers, but if many decisions are required or a large amount of information must be organized the computer has been found useful. Young children respond well to the computer mode of learning, which consideration deserves attention. One popular computer game, the Sumerian game, has been developed by the IBM Corporation. The game

is designed to teach sixth graders some principles of economics as they applied to the neolithic revolution in Mesopotamia during the fourth millennium B.C. After an introductory program tape and slide presentation the pupil seats himself at a computer terminal and assumes the role of the Luduga I, Priest King of Lagash in the year 3,500 B.C. The player is presented with a series of problematic situations and must indicate on the typewriter his decisions concerning such questions as how much grain to plant for that year, how much to save, and how much to feed the people. As the game progresses, the pupil is faced with problems of expanding populations, irrigation, foreign trade and other complex situations which confront a changing economy ... The objective of the game is to make decisions in such a way that the city-state survives a series of natural and political crises, that the population grows, and that a high rate of technological innovation is maintained ... Throughout the exercise the child makes decisions and enters his answers at the computer terminal. The computer immediately returns a progress report including the number of bushels of grain in the harvest reaped from the seed grain set aside for planting, a report on his inventory, crop losses from disaster, and the size of the population.¹

¹Elliot Carlson, Learning Through Games (Washington, D.C.: Public Affairs Press, 1969, pp 151-159).

If the student plays the game successfully, Sumeria grows and prospers. If he is not successful, the civilization starves! Through playing the game the student learns some of the principles of basic economics. Games of this nature have been enthusiastically endorsed by many educators, but the difficulties in constructing an effective game and the cost of computer time in relation to other teaching techniques may limit their development and adoption.

EDUCATIONAL AND INSTRUCTIONAL TELEVISION

Perhaps the most widely used and most thoroughly researched technology applied to education has been television. Projects using television fall into two general classifications: Instructional (ITV) and educational (ETV), but the difference is not always clear-cut. Educational television refers to any television transmission (either on regular television channels (open transmission) or through a closed circuit television system (CCTV)) for the purpose of bringing additional material to the classroom. This material may be simply "enrichment" or it may be part of the basic subject matter (e.g., a Shakespeare play) from which lessons are developed. Within this broad framework much commercial television may be classified as "educational." Since the "content" of the broadcast can include both "live" and "canned" (film) segments, the television may be

seen as primarily a communications vehicle spanning time and space. Educational Television appears to be useful because it solves communications (but not necessarily learning) problems.

The instructional application of television, however, is more specific than the educational communications function. Television is used for the direct support of subject-related instruction. The classroom teacher is either supplemented or supplanted by instructional television. ITV has been found useful for ameliorating problems of teacher shortage (when not enough good teachers were available for all the classrooms or for transmitting the efforts of a unique expert teacher over a broad area). Applications of ITV have varied from excellent to very poor. Chu and Schramm, studying the reasons for variation in quality have reported two generalizations. First, "educational television works best when it is felt to be needed--in answer to a recognized problem that cannot very well be solved otherwise." Second, Television works best when it is made a part of an integrated instructional package."¹ In other words, simply adding television to the classroom as a gadget has not been effective. As with all technologies, television works when its use is carefully planned.

¹Goodwin Chu and Wilbur Schramm, Learning From Television: What the Research Says U.S. Office of Education Report, presented by Schramm at the DAVI Convention, March 1968. See also Educational Television: The Next Ten Years Bulletin 1964, No. 12, (OE-34036) (Washington, D.C.: U.S. Office of Education (HEW), GOP, 1965).

One outstanding example of the effective planning and use of instructional television may be found on American Samoa. Since 1961 the educational system of American Samoa has undergone a virtual revolution in educational thinking and planning, especially in the deliberate application of an advanced technology to the solution of persistent and chronic educational problems. In all-new consolidated schools, designed for television instruction, the Samoan child views television from one-quarter of the school day in the early grades to one half of the school day in high school. Each classroom also has a native Samoan teacher who views the television lessons with his students, manages the operation of the classroom, and attends to individual needs in preparing for and following up the television lessons.

There are four essential elements in this system of education, and each was designed specifically to relate to the others. The production process, the television transmission system, the lesson design, and the local school. The design of each element evolved from a careful analysis of the nature of the Samoan child and the education problems caused by peculiarities of language and culture, and from a careful analysis of the inherent difficulties of educational system, especially a critical shortage of qualified

teachers. The essential purpose for the system's design was to insure effective teacher-student communication for learning.

When the TV teacher appears on the television screen, the children greet him as a friend. They respond to questions and are genuinely involved in the lesson. This is not the passive viewing of entertainment or "enrichment" such as has been frequently observed in other uses of instructional television. The television is an active (and interactive) part of the child's learning process. It is this quality of the instructional television which is most difficult to explain and may remain only vaguely appreciated unless observed.

In Samoa, television functions in an appropriate way in relation to the total learning environment, and the children respond positively to two aspects of the broadcast. First, the television teacher talks directly to the child, says good morning, etc., and they respond by name to the teacher. This and similar devices insure a close rapport between the children and their television teachers. Second, the children respond to the quality of the instruction and the quality of the planned lesson. There is no question about the appreciation for quality in the instructional process on the part of even the youngest children. Although critics of the Samoan experiment have noted a lack of empirical data on

achievement and on the operation of the system, there are several favorable elements obviously present. First, there is a well-run, creative atmosphere developed by a dedicated, talented, and sincere staff. Second, there is a strong sense of purpose and contribution on the part of the staff, and there is excitement, attention, and involvement on the part of the students. Third, there are still signs among the faculty and in the schools of changes so radical that adjustment to upgrading and improving is a continuing activity. And fourth, the whole Samoan education system is based on a deliberate plan which recognized major educational problems and planned the use of a broad-scale technology to solve them.¹

A recent development in educational television may have profound effects, especially for the field of early childhood education. Called Sesame Street, the series was produced by the Children's Television Workshop (National Educational Television). Two major forces underlay the development of this series. First, the principles which led to television advertising that could attract and hold the attention of even very young children were felt to be applicable to instructional design. Second, television was available to poverty populations since even most ghetto homes have

¹Based on personal observation and discussions with Roy Cobb, Director of Education, American Samoa, and members of his staff.

television. In this way, even very young children could receive instruction in basic skills and concepts prior to entering the public schools.

After its first months of broadcast, there are reports that Sesame Street is proving itself successful for teaching the alphabet, number sense, and other basic concepts to very young children. This success deserves particular recognition since the program is broadcast primarily on VHF channels over educational television stations. These stations are not normally available to or used by the populations for which Sesame Street was primarily intended. In order to make information about the broadcasts common knowledge a concerted advertising effort was undertaken. Many community organizations and national associations contributed to this advertising effort. Buttons were distributed in supermarkets and full-page ads have appeared in many newspapers. Parents have been urged to write for a free sample of a parent's guide to which they may then subscribe at a nominal price. This advertising builds listener-ship and encourages a relationship between the child's viewing and the parent's responsibility for early education.

This use of broadcast television for instructional purposes raises some important questions for the schools. If television can reach early childhood (or other) populations, both in "the ghetto"

and in other environments, and if television can motivate children to learn effectively prior to their entering the school, a strong and viable technological system for education will have evolved. This alternative to pre-school preparation may not only be more cost effective than designing additional kindergarten or pre-kindergarten programs, but it has the distinct advantage of involving the child's parent and home environment in the process of learning. These conjectures require information on the effectiveness of Sesame Street and other educational television broadcasts before they can be accepted as planning principles. Nevertheless, these systems represent potentially important areas for careful planning.

CLASSROOM USES OF TECHNOLOGY

Teachers have used various types of classroom technology for years. Among the most common are movie projectors, tape recorders, slide projectors, and overhead projectors. During the past ten years teaching machines, language laboratories, telephone and tele-lecture applications, and videotape recorders have been added to this list. Some very recent developments include the talking typewriter, two-way or "talk-back" television, an electronic music keyboard, and microfilm and micro-fiche readers. These devices are generally referred to as "classroom technology" because they can be used in the "standard" school classroom, operated by a teacher

or a student, and applied to the on-going program of instruction. A selection of these devices can be found in virtually every school and applied to a wide variety of instructional and educational needs.

Research in the technology field has concentrated in three areas: tests of the effectiveness of each technology as a teaching device, tests of the superior effectiveness of one technology over another (or over a live teacher), and tests of the reactions of receivers to technological messages. The research has not been generally applicable in useful ways to real learning situations in the schools. Other research efforts and studies have dealt separately with the support of each technology--physical facilities, light and noise levels, seating and related concerns--in an attempt to improve the conditions in which technologies are used. Some attention has been devoted to administrative and management problems related to technological implementation and use. A considerable and growing body of literature explores the nature of learning processes and interrelates technology, principles of learning, and the conceptual organization of subject matter. Although a tremendous amount of money and effort is being devoted to technological research, something seems to be missing. All of this research and development has failed to result in any major change either in the use of technology within the schools or in the tasks of education.¹

¹Kent, Le Baron, and Peterson, op. cit.

The chief cause for these problems in the use of technology appears to stem from either a lack of perception or a lack of appreciation for the necessity to redesign total learning situations, or at least to begin with a clear statement of learning goals and the comprehension of the system presently working to achieve these goals. There appears to be a general lack of systematic and thorough planning in the application of technology to perceived problems of educational improvement. Technology can perform certain functions which are appropriate to their nature and which can support learning. They should not, however, replace or supplant a teacher performing these same functions unless the role of each is designed in relationship to the other.

Planning the use of classroom technology (and indeed planning the use of computers and television) might be improved through the consideration of some basic principles which may be stated as follows:

1. The effective use of technology will probably alter the nature of the institution--the school and classroom.
2. Technology should not be viewed casually; it implies the processes of technology applied to education.
3. Functional analyses of the teacher-learning process in the manner of "man-machine systems" will be required before effective decisions about the use of technology can be made.
4. The technologies should be selected and implemented in accordance with their contribution to the various

types of learning, some of which lend themselves to mechanization more readily than others.

5. The technologies serve, basically, two purposes in the instructional environment; they extend the range of available experiences, and they extend the teacher's (or learner's) control over the stimuli.
6. The technologies also increase the potential impact of learning beyond that which may be acceptable within the school, i.e., it could be possible to smell war!

Most attempts at implementing multi-media and other technologies seem to remain short-ranged and minor thrusts on the educational system. What is required, however, before any technologically supported program can be successful is an analysis of the whole educational structure. The problems are not problems of technology; they are problems of education for which some technologies may offer viable solutions. The use of technology in education will probably remain ineffective to the degree that the purposes, goals, and processes of education remain vague or misunderstood.

THE EMERGENT EDUCATION-INDUSTRY RELATIONSHIP

The preceding background should indicate that the area of education-industry relationships is extremely complex, highly volatile, and generally confused. Industry, and most individual organizations within industry, are concerned with defining a role for themselves and a relationship with the public schools. This

task has proved exceedingly difficult, and many organizations have pursued costly false directions. One useful perspective, however, is provided by Locke's suggestion that there are four kinds of "educational businesses": (1) generating, collecting, organizing, and selling information; (2) creating and marketing systems of instruction; (3) transmitting knowledge and information (communications); and (4) marketing specialized services (consulting).¹ Most members of the education-industry are concerned with one or more of these functions.

Some writers on the subject are not so willing to accept prima facie good intentions. Heddinger writes:

So long as industry is anxious to stand with its tin cup at the federal dollar trough along with all of the other social and governmental agencies which have come to depend upon such federal assistance for their very existence, then we in education are in real trouble because centralized control of education is inevitable and industry's greater participation in education will only hasten that day.²

Heddinger offers no basis for this conclusion in his article, and so far as this investigator can discover, his prediction has not been borne out. A more reasonable summary of recent history is presented by Vance:

¹Robert W. Locke, "Education and Business: How Much of a Partnership?" Business Education World, 48 (October 1967) 5-6.

²F.M. Heddinger, "Industry's Role in Education Defined," American School Boards Journal, 155 (September 1967) p. 30.

Big business was attracted to education in a big way in 1966. In the sobering years of 1967 and 1968 big business learned that changes in education take time. In 1967 and 1968 educators, curriculum reformers and those instructional materials producers who had been around for sometime (not really very big business) became more aware of what they really knew all along: dramatic change in education will not occur until teachers and administrators have been prepared for dramatic change.¹

Saettler emphasizes this point of view and suggests a basic weakness in the relationship:

While government and industry, for example, each determines, in large part, its own research and development, education remains almost wholly dependent on derived technologies which, if applied, often conflict with educational goals and purposes ... While there is nothing wrong with the idea of private industry serving education as producers of what education is not able to produce itself, it can be seen that the widespread use of instructional materials and devices which educators had no hand in designing or testing means that it is the commercial producers rather than the educators who have much to do with determining the curriculum.²

It is difficult to accept Saettler's premise that applied technologies must conflict with educational goals, or that industry produces materials educators have no hand in designing or testing.

¹John F. Vance, "Role of the Instructional Materials Industry," Preparing Educators to Meet Emerging Needs Edgar L. Morphet and David L. Jessor, eds., (Denver: Designing Education for the Future, 1969) p. 78.

²Paul Saettler, "Instructional Technology: Some Concerns and Desiderata," AV Communication Review, 17 (Winter 1969) 357-361. Saettler may object to these criticisms because he talks of open systems in referring to educational processes which somehow will achieve openness without causing changes in the contributing institutions.

These statements effectively posit a virtual dichotomy between something called education and something called industry, education being dominated by the stronger force. A second implication is more subtle, yet more destructive than the first: that education should be a self-sufficient, limited, and ultimately closed system--requiring only carefully defined products from another system--is absurd. Indeed, it is not only contrary to history, but it establishes a basis by which new forms of cooperation become exceedingly difficult. If each institution--education or industry or both--must be primarily concerned with self-identity and life space, rather than the achievement of mutually accepted goals, then it seems predictable that tension will accompany any effort at cooperation. In this respect, Holton's position appears reasonable.

The fundamental patterns for the relationship between industry and education is just now being invented. It has to be a partnership in a very complex consortium in which the teaching profession, the academic subject matter specialists, the industries, the regional laboratories, the financial granting agencies, and the schools of education--above all the last--have to be full and strong partners.¹

None of these positions explains the direct and necessary involvement between these two basic institutions of our society; they simply imply varying degrees of cooperation, competition, or

¹Gerald Holton, "The Education Industries: A Discussion," Harvard Educational Review, 37 (Winter 1967) 113.

defensiveness. But if education is viewed as a process (rather than an institution) encompassing the whole of society, then some integral relationship must exist between the schools and the industries, and it must exist at the conceptual level. Komoski has clearly perceived this relationship and calls the present era the "second industrial-instructional revolution." He states,

the interaction of industry and education in the United States has entered a new stage in which the earlier indirect and unconscious interplay of education and industry has been transformed into a closely-knit interdependency by the complex educational and social implications of the second industrial revolution.

Under these changing circumstances:

A once vital local educational system frequently took the form of unadaptive conditioned responses rather than the form of adaptive responses to changing conditions. The results of this "tendency" is now clear: American industrial and social life has undergone a revolution since the development of the nineteenth-century factory-like school, while the school itself has undergone little more than a haphazard evolution. We should not, therefore, be surprised that one group of today's educational reformers are in revolt against "unresponsive," "mass produced," "industry-inspired," educational systems, while others advocate the use of "new industrial technology" to bring about a new "instructional revolution" characterized by "innovation," individualization, "highly responsive," instructional systems. This latter group of reformers seems to be saying that the problem now facing American education is caused by the fact that leftover forms, practices, and techniques of this country's first (nineteenth century) industrial-instructional revolution are now in conflict with the newly emerging forms, practices, and technologies of what they see as a long overdue "second" industrial-instructional revolution, although none of them might put it so theoretically.

From this point of view, Komoski finds that

If one grants that there is a fundamental conceptual relationship between industry, as the systematic ordering of man's thinking about production, and instruction, as the systematic ordering of his thoughts about how to transmit learning, then it would seem inevitable that in a highly industrialized society the organization of learning would be profoundly affected by industry.¹

Komoski's comments are dealt with at length because they are precisely relevant to the nature of changing institutions in light of changing technologies, and to the structural dilemma provoking the explication of the education-industry planning consultant's role.

Educational technology has changed from mechanical to systematic, i.e., the effective interrelationship of all parts is critical to the operation of any part within the system. Systematic technologies require the reconceptualization (and frequent redesign) of the entire system. Developing new and viable second generation technological education systems will require radical structural changes in the schools and new "interdependent" linkage among industrial organizations, schools, and many other educational

P. Kenneth Komoski, "The Second Industrial-Instructional Revolution," Teachers College Record, 71 (December 1969) 327 -338. From another point of view J. Kirschner suggests that educators interest in technique over the past two thirds of a century accounts for a traditional interest in technology, but he warns against the dehumanizing inherent in overemphasizing technique. ("Education as Technology: Implications from the History of an Idea." Teachers College Record, 70 (November 1968) 121 - 126.

institutions. But we are faced with a dilemma: if the application of technology to education means the achieving of important educational goals, and this application means changing the structure of public education, then to what degree, based on what values, should the present structure be protected or the power of the technology released, when the two are in conflict? This problem is at the heart of the industry-education relationship, because the technological solutions developed by industry are forcing education to defend its values in terms of its achievements, not its institutional structures.

IMPLICATIONS FOR THE FUTURE OF INDUSTRY-EDUCATION RELATIONSHIPS

The development of interdependent relationships among the many partners in the educational process remains exceedingly difficult. This direction, however, appears preferable to forms of cooperation or conflict which imply rigid instructional definition and maintenance. Since the entire field of education (i.e., as a process within a society) is being scrutinized as a result of technological change, some implications can be suggested.

The first implication is that the public schools will not be affected by these changes, in which case they will continue to be

considered obsolete and largely ineffective at dealing with change. No one would suggest this stance, but the vast technological and social changes during the past ten years--and the industry-education relationship is one--means that accepting change is inevitable. Any group which ignores this encounter will be passed by! With this thought in mind, the following areas require attention:

An Emphasis on Planning

Large-scale interdependent technological systems require an emphasis on planning rather than on operation. Since all of the parts must be integrated and since all function together, no part can be designed or operated without a clear knowledge of the whole system. This basic aspect of technology is beginning to find acceptance in the field of education. This challenge will be met by conceptualizing the total redesign of alternative programs to meet educational needs. The next chapter will deal with these areas.

New Teaching and Support Roles

It is now commonplace to speak of such "support team" members as audio-visual aides, educational technologists, test and measurement specialists, and curriculum planners, but many new roles will emerge from the technological interdependence. Some functions will remain in the schools, but many--some quite closely related to instruction--may be located in R&D centers or industries. These

changes may represent the greatest threat to teachers. The education profession now must broaden itself to accept many new types of educational personnel, including many who may never work directly with children: computer programmers, learning system engineers, electronic engineers, specialists in acoustics and lighting, behavioral psychologists, evaluation specialists, and planning generalists. Integrating this tremendous number of roles and the institutions which house the practitioners of these roles becomes a significant problem for the use of new technologies.

Funding and Control

The implementation of technological systems requires new thinking about the use of educational funds and the control of the education process. Carefully designed technological systems are expensive, both to plan and to implement. They have very high "start-up" costs, but once they are implemented they usually achieve lower operational costs than the system they replace. Since a broad-based technological system, such as a computer-assisted instruction or an instructional educational network, can operate over a considerably larger area than one school district, new patterns for planning and control will require exploration. New concepts of funding (and here primarily the political task of training the public to accept them) and new forms of cooperative interaction among districts seem required.

COMPETITIVE STRUCTURES

There is a clear trend for the development of competitive structures to deal with educational tasks previously assigned exclusively to the schools. The negative reaction to this development usually states that industry will profit from the achievement of children based on predetermined and limited behavioral profiles. The positive aspect may be emphasized if the word competition is changed to alternative. The public schools clearly have not presented a broad spectrum of alternatives for the education of young children. Since the generating of alternatives is basic to systematic planning and technological improvement, this environment is healthy because new patterns of effective education may result from this increasing attention.

A BASIS FOR THE CONSULTANT ROLE

Important implications from this chapter concern the structure of a consultant role and the organizations and processes of this interaction. The tasks suggested for the consultant emerge as those of integrating the functions of education and industry, implementing appropriate planning procedures and techniques, and linking the diverse elements in the developing relationships among partners in the educational enterprise. It is important to emphasize that this role responds to the conditions brought about

by Komoski's "second technological revolution," and, therefore, it indicates a new direction in educational communication and planning. While the next chapter will deal with the processes of planning which will form a basis for the consultant's knowledge and actions, this chapter has sought to provide a formal structure in which the consultant role would find itself embedded.

CHAPTER III

THE PROCESS AND ORGANIZATION OF PLANNING

INTRODUCTION

This chapter will attempt the development of a schema for understanding the processes and the organization of planning. The chapter will form a background to defining the role of the educational planner and the role of the education-industry planning consultant. The chapter will first attempt to define educational planning and to distinguish planning from management and evaluation. Several levels of planning and the major characteristics of the planning process will be explicated. This discussion is followed by an enumeration of some purposes and theoretical bases for planning, which lead to the presentation of an integrated planning model. The chapter then concerns itself with the organization of the planning process at various governmental levels. The structure of an effective planning group, including the functions and skills required by such an activity, are discussed as they relate to the role of the planner. The implications of this discussion for the design of a consultant role are then developed.

Only inadequate attention has been devoted to the areas of the planning process in education. Indeed, as Ozbekhan suggests,

Planning is too new and raw a discipline, or art, or science, to require us to indulge in a lengthy exegesis to establish the working hypothesis that we need. Tentative ideas of a description character can be derived from observation and sustained by tying them to the main, the salient elements that make up the context of planning activities.¹

But if the planning activity is new, its importance cannot be underestimated. Chase suggests that:

It is possible that the most significant development in education during the next decade will be the emergence and wide spread adoption of new concepts and new technologies of planning. Rapidly expanding theoretical knowledge and constantly refined technological instrumentalities make status in almost every field today a fleeting condition. This is not yet characteristic of education where institutional inertia, popular fears and political caution retard the application of advanced knowledge and techniques. Yet the scent of change is in the educational air and many have sniffed it and found it exhilarating, if not intoxicating.²

Lecht emphasizes that:

The extent to which we are likely to implement our educational priorities depends on how rapidly the economy grows and on the competing claims for resources arising from the

¹Hasan Ozbekhan, "Toward a General Theory of Planning," Perspectives of Planning, Erich Jantsch, ed., (Paris: Organization for Economic Cooperation and Development, 1969), p. 52.

²Francis P. Chase, "The Status of Educational Planning in the United States," Education Planning in the United States, Stanley Elam and Gordon I. Swanson, eds., Second Symposium on Educational Requirements for the 1970's, An Interdisciplinary Approach, Phi Delta Kappa, Commission on Education (Itsaca, Illinois: F. E. Peacock, 1969), p.41.

pursuit of other goals ... From this viewpoint the task of policy, and essentially of politics, is to reconcile these claims, and to keep a multitude of competing claims within the constraints set by the availability of the anticipated resources.¹

The means for selecting among competing claims within the pattern of constraints is found through the process called planning.

SOURCES OF A DEFINITION FOR EDUCATIONAL PLANNING

It may be safely stated that there is no clear-cut field called "educational planning." At the same time one is forced to recognize several sub-areas which may contribute to the definition of such a field. Among these are national-level planning for underdeveloped countries, extensive efforts under ESEA Title V of the Elementary and Secondary Education Act.² Culbertson indicates that there are at least three different but somewhat interrelated planning traditions which have implications for educational planners. These include, "economic forecasts of educational needs and plans to advance economic and social development in developing

¹Leonard A. Lecht, "Strategic Variables in Planning," Planning and Effecting Needed Changes in Education, Edgar L. Morphet and Charles O. Ryan, eds., (Denver, Colorado: Designing Education for the Future: An Eight State Project, June 1967), p. 9.

²See, for instance, The State of State Departments of Education, The Fourth Annual Report of the Advisory Council on State Departments of Education. (Washington, D.C.; U.S. Office of Education OE 23050-69), 1969.

nations, second, and array of planning techniques found in the technology associated with operations research, and third, PPBS--an outgrowth of operations research."¹ The field of corporate planning, especially as it relates to long-range planning, represents a relatively recent contribution to this field. Worthwhile treatise recently published in the business management field emphasizes the new interest being directed to long-range and comprehensive planning. These texts draw extensively on the base disciplines of economics, political science, and the general area of behavioral sciences.²

Two other sources of a definition should be included. The first is the tradition of operations research and systems engineering; the second is the tradition of systems design and planning. These fields overlap and interlink depending on purposes and needs (and on the authors who explicate them). Together they represent the application of technological process to defining and solving social problems. An important resource on this emerging trend of systematic social design is Boguslaw's volume, The New Utopians.³

¹Jack Culbertson, "State Planning in Education, in Planning and Effecting Needed Changes in Education, op. cit., pp. 271-272.

²An excellent review is provided by Robert J. Mockler, "Theory and Practice of Planning," Harvard Business Review, 48 (March-April 1970) 148-159.

³Robert Boguslaw, The New Utopians: A Study of System Design and Social Change (Englewood Cliffs; New Jersey; Prentice-Hall, 1965).

Boguslaw traces planning from the early utopians through the economists and the mechanists to the present work of system analysts. The volume emphasizes the important contributions of early planners but warns against the over-optimism of the new, computer-oriented utopians who seem bent on mass societal transformation.

Each of these sources can contribute to a definition of planning. It remains, however, for educators to undertake the hard task of synthesis and the development of a useful statement of planning process and organization.

A DEFINITION OF EDUCATIONAL PLANNING

Virtually every author concerned with the field has attempted at least one definition of planning. It may be useful to look at some of these definitions. Ozbekhan suggests that "planning is thinking about what is not; about what may never be; it is imagining and speculating. It is on all these and many more scores, divorced from a reality in which, as all hard-headed 'practical' people know and go around saying, is made up of facts--present facts."¹

Ackoff concurs that "planning is the design of a desired future and of effective ways of bringing it about." He continues by suggesting that planning is a decision-making process but

¹Ozbekhan, op. cit., p. 70.

cautions that not all management decisions are planning decisions.

He finds that planning decisions have these characteristics:

1. "Planning is something we do in advance of taking action; that is, it is anticipatory decision-making."
2. "Planning is required when the future state that we desire involves a set of interdependent decisions; that is, a system of decisions. (The principal complexity in planning derives from the inter-relatedness of the decisions rather than from the decisions themselves)."
3. "Planning is a process that is directed toward producing one or more future states which are desired and which are not expected to occur unless something is done."¹

Anderson and Bowman derive a definition of educational planning as follows:

Planning is the process of preparing a set of decisions of action in the future. The search is for the best alternative that can be identified or discovered with a reasonable output of time and effort in search and comparison, but this will never be the best in any absolute, truly optimal sense. In practice planners' decisions come closer to the notion of "satisfying" than of optimizing behavior.... Educational planning is the "process of preparing a set of decisions for future action pertaining to education.... The essence of educational planning is the scheduling of coordinated streams of students and of teacher trainees for shorter or longer distances in various channels of training and schooling."²

¹Russell L. Ackoff, A Concept of Corporate Planning (New York: Wiley Interscience 1970), pp. 2-3.

²C. Arnold Anderson and Mary Jean Bowman, "Theoretical Considerations in Educational Planning," Educational Planning, Don Adams, ed., (Syracuse, New York: Syracuse University Press Center for Development Education, 1964), p. 10ff.

Morphet appears more realistic than these earlier writers.

He suggests that:

Planning is not a process of speculating on probable developments and preparing a theoretical blueprint for meeting needs. Rather, it is a process of attempting to determine appropriate goals and objectives, obtaining and analyzing pertinent information that will bring into focus present and emergent problems and needs, and obtaining agreement on steps and procedures that are designed to meet these needs so that objectives can be obtained.¹

For the purposes of this chapter, the following definition of planning appears useful:

Planning is the process for the generating of alternative futures, the selecting of appropriate futures from these alternatives, and the relating of these futures to the on-going system. Planning requires evaluation of past actions, models of desirable future actions, insights about the dynamics of the future, knowledge and assumptions about resources, statements of desirable and possible aims and goals, and the determination of productive relationships among these factors.

Anthony suggests that planning is "roughly, deciding what to do," (and distinguishes it from control, "roughly, assuring that desired results are obtained."² In this respect Ozbekhan's comment is pertinent:

Planning is sui generis, a human social activity which is

¹Edgar L. Morphet, Planning and Effecting Needed Changed in Education, op. cit., p. xiii.

²Robert N. Anthony, Planning and Control Systems: A Framework for Analysis. (Boston: Graduate School of Business Administration, Harvard University, 1965), p. 10.

designed to act on the environment for the purpose of changing it in such a way that tendencies toward coherence and cohesion are enhanced and tendencies toward disintegration and dissolution are kept under check. In other words, planning is a process whose function is to reduce entropy and increase organization within the environment.

A definition of educational planning may be suggested by simply limiting the focus of comprehensive planning to education. While educational planning takes place within carefully defined institutional boundaries, its purpose is to adjust behavior towards the achievement of recognized educational goals.

Distinctions Between Planning and:

Management. -- In order to adequately define the planning process it is necessary to distinguish planning from a number of related processes. As was indicated earlier, some authors tend to see planning as part of the general process called "management." Other writers, however, distinguish between planning as a process, especially long-range and normative planning, and management. Planning differs from management in its decision-making process. The planner is essentially a staff member who makes recommendations to the policy-maker. As Duncan suggests, "The planner is one who poses alternatives; he is not a final decision-maker. As such

¹Ozbekhan, op. cit., p. 111.

he influences decisions, to be sure, but he does this through the careful appraisal of the possible alternative course of action."¹ Management, however, describes the decision-making process within the organization. Management resembles the political process, both of which involve consensus and setting a course of action. Planning is viewed as distinct from these processes, but related to them, because it provides both alternative goal structures, and methods of achieving them.

Evaluation and Research.--The planning process should also be distinguished from the evaluation and research functions.

Evaluation in education signifies describing something in terms of selected attributes, and judging the degree of acceptability of 'suitability' of that which has been described ... the process involves three distinct aspects: (A) selecting the attributes that are important for judging the worth of the specimen to be evaluated, (b) developing and applying procedures that will describe these attributes truly and accurately, and (c) synthesizing the evidence yielded by these procedures into a final judgement of worth.²

The key word is judgement, which implies a pre-determined baseline, since evaluation cannot take place unless goals have been selected and established. In this respect, evaluation is a meaningful

¹Merlin G. Duncan, "Planning and Politics," Paper presented at the National Conference on Educational Planning, Mankato State College, Mankato, Minnesota, October 7-25, 1968, p. 46.

²Encyclopedia of Educational Research. Chester W. Harris, ed., (New York: Macmillan, Third Edition, 1960), p. 482.

concept only within a closed system. Planning, on the other hand, can operate within an open system. Both may be contrasted with Research which is seen as the comparison of describable worlds (or the significant variables within describable worlds) for the purpose of determining the efficacy of differing variable mix. Research differs from evaluation. A research conclusion reflects a measurable change attributable to variation within a fixed (or constant) world. Evaluation judges causes, effects, and processes based on a recognition of significant factors but on less than complete control of the world. Both, however, can reflect change only against a pre-determined measure of significance or statement of goals, and this remains the task of planning. Eide indicates that, "From the policy-makers point of view, planning provides the raw material for decisions in terms of clearly formulated priority choices and alternative lines of action, their implications worked out and explicitly stated."¹ He makes the following distinctions:

Decision making might be defined as the fixing of values of output variables. Programming might be defined as estimating the values of input variables when the values of output variables are given. Implementation might be defined as the checking of whether values of coefficients describing structural co-variance correspond to expectations. Research

¹Kjell Eide, "The Planning Process," Educational Planning in the United States, op. cit., p. 80.

might be defined as the systematic study of structural coefficients within the model, including the developing of theories about the determinents of such coefficients. Forecasting might be defined as estimating the values of output variables, when the values of input variables are given (reversing the programming process). Planning might be defined as operations with a model in which, a priori, neither input nor output variables are given.¹

Levels of Planning

The literature on corporate planning usually distinguishes three levels of planning and control. These have been called by Anthony strategic planning, management control, and operational control. The term management control might be replaced by management planning; thus, there is established a control (evaluation) function and a planning function on the mission level. Operational control deals with a specific operation of a program or organization and is not of concern in the context of this paper because it is clearly a management function.

Strategic planning, according to Anthony, includes "choosing objectives and (2) planning how to achieve these objectives....In strategic planning, the task is much less one of making an optional choice than it is one of being imaginative and systematic in formulating alternatives from which the choice will be made."²

¹Ibid., pp. 78-79.

²Anthony, op. cit., p. 26 ff.

Strategic planning is related to the concept of long-range comprehensive planning. It precedes the organization of the institution (in the case of education, the schools) and seeks to define a system based on viable and major processes. As O'Toole suggests, "What is required is an analysis of the whole educational structure before the fact. The system needs to be studied comprehensively and all the parts of the total process fitted together in a meaningful whole."¹ This statement clearly indicates the task of strategic, or long-range, planning.

Anthony defines management control as follows:

Management control is a process carried on within guidelines established by strategic planning....The management control process is intended to make possible the achievement of planned objectives as effectively and efficiently as possible within these givens. The management control process involves making decisions about what to do in the future, and this is planning in the ordinary means of the term. But the planning decisions made in the management control process are of a somewhat different character from those made in the strategic planning process.²

He goes on to suggest these relationships between strategic planning and management control:

Strategic planning is the process of deciding on objectives and policies. It has to do with major decisions with long-term

¹John F. O'Toole, Systems Analysis and Decision-Making in Education (Santa Monica, California: System Development Corporation SP2020 June 1965), p. 12.

²Anthony, op. cit., p. 26 ff.

consequences. Management control has to do with the on-going operation of the enterprise, within the guidelines established by these policies ...Unless the distinctions are understood, mistakes will be made in (1) stating generalizations as if they were applicable to both processes, (2) applying to one process a generalization that is valid only for the other, (3) or giving too much emphasis to one process and not enough to the other.¹

The essential distinctions in the activities, strategic planning and management planning, which are significant for this paper, include the following:

1. The nature (and source) of the information required for each activity.
2. The external (strategic) as opposed to internal (management) viewpoint from which the same or related activities are considered.
3. Strategic planning relates to the whole of the organization (integration is, in fact, an aim), but management planning picks and chooses among parts of the organization.

This section has delineated carefully some distinctions in types of planning. It is important to recognize major difference between long-range, comprehensive (or strategic) planning and management planning (or control) as an activity related to the operation of the on-going system.

libid., p. 62.

Characteristics of Planning

Having distinguished long-range, comprehensive planning from the planning function of management, it is worthwhile to note some of the salient characteristics of this activity. Ozbekhan indicates that the fundamental characteristic of the planning process is that it is

conscious and rational, and that it represents acting on some object, defined as environment. Such action is undertaken for the purpose of effecting changes in the environment. Planning, therefore, can be said to include the following: (1) Perception of the environment; (2) Definition of the purpose of the changes one wishes to effect in the environment; (3) and design of the acts whereby the environment will be altered.¹

Brooks suggests that in discussing the planning process it is necessary to emphasize that "planning is a process, not a product; (2) comprehensive planning is not synonymous with a comprehensive plan; (3) and, the strongest impetus to effective educational planning is the commitment of the educational leadership to the necessity for the function."² Rackley and Carroll feel that "education planning should be directed toward meeting clearly

¹Ozbekhan, op. cit., p. 152.

²Richard D. Brooks, Comprehensive Planning in State Educational Agencies (Madison: Wisconsin Department of Public Instruction, 1968), p. 10.

defined and generally accepted goals."¹ Determining and defining goals is an important aspect of long-range comprehensive educational planning. In this respect Coombs suggests that there are three new dimensions in educational planning: its comprehensiveness of coverage, its much longer time perspective, and its more conscious and detailed integration with national and social development.² He cautions that educational planning of this new variety must be concerned not simply with expanding the old system but also with changing it.³

Coombs leads us to acknowledge this clear distinction between the traditional planning which was limited in its scope and closely related to management planning and the new long-range, comprehensive planning which is emerging in many fields today. Ways has indicated six characteristics which typify this newer approach to planning:

1. A more open and deliberate attention to the selection of ends toward which planned action is directed.

¹J.R. Rackley and Donald M. Carroll Jr., "Supplementary Statement," to Jack Culbertson, "State Planning in Education." Planning and Effecting Needed Changes in Education, *op. cit.*, p. 290.

²Philip H. Coombs, "What Do We Still Need to Know?" The World Yearbook of Education, 1967; Educational Planning, George Z.F. Bereday, Joseph A. Lauwerys, and Mark Blaug, eds., (London: Evans Brothers, 1967), p. 60.

³ibid.

2. A more systematic advanced comparison of means by criteria derived from the ends selected.
3. A more candid and effective assessment of results usually including a system of keeping track of progress toward interim goals.
4. An effort, often intellectually strenuous, to mobilize science and other specialized knowledge into a flexible framework of information and decision.
5. An emphasis on information, prediction, and persuasion rather than on coercive or authoritarian power.
6. An increased capability of predicting the combined effect of several kinds of simultaneous actions on one another ¹

Hall helps to distinguish the characteristics of modern planning by listing its values and its limitations:

1. Planning makes it easier to achieve integrated and purposeful action.
2. Planning anticipates troubles and avoids delays.
3. Planning provides the logical basis for coordination and control of both systems engineering and development.
4. Planning helps to achieve economy of executive systems engineering and development effort.
5. Planning facilitates other management functions.
6. Planning encourages the development of some goals because it normally emphasizes the importance of decisions related to goals.

Max Ways, "The Road to 1977," Fortune, January 1967, p. 93ff.

Hall also noted that planning faces these limitations:

1. Planning takes time.
2. Planning is expensive, not only in time, but also in money, professional technical people, and physical laboratory resources.
3. Design and use of plans tends to make the organization inflexible.
4. Plans are based on assumptions and forecasts of future conditions, so planning is limited by the extent to which these conditions can be forecast reliably.
5. The design of short-and long-range standing plans is limited by a lack of recurring problems.
6. Planning is limited by its undesirable effects upon individuals.¹

In summary, the long-range comprehensive planning which functions as the basis for this paper, has these characteristics: (1) it emphasizes a process which states goals and relates resources to achieving these goals; (2) the plan which results from this process is subject to constant change and modification; (3) the planning process precedes the management process and is separate from it.

The Recent Emphasis on Planning

This emphasis on long-range, comprehensive educational planning is a relatively recent phenomenon, having received

Arthur D. Hall, A Methodology for Systems Engineering (Princeton, New Jersey: Van Nostrand, 1962), pp. 78-80.

significant attention only during the last five years. Culbertson feels that this trend has been influenced by:

The increasing value being placed upon quality education and the impact upon citizens, and their leaders of the increasingly large investments to achieve quality; the trend towards the use of more systematic planning in state and federal government generally; the large planning capacity of the business community and its growing involvement in education; and the increasingly wide array of tested planning techniques which are now available for use.¹

For Coombs, the emphasis on increased educational planning is caused by "the sharp increase in popular aspirations for education; the acute scarcity of resources; the inherent inertia of educational systems which has caused them to respond too sluggishly in adopting their internal affairs to new external necessities; and the inertia of societies themselves."² The increasing emphasis on educational planning indicates a response to pressures for the adoption of new technologies and the effective use of limited resources.

Eide sees the trend towards planning stemming from:

the rapid development in recent decades of science--and the social sciences in particular....Planning may be regarded as a systematic application of research to problems of policy, constituting the main link between research and policy-making. Only when research has reached a stage of basic knowledge and theoretical linking together of different traditional academic disciplines, permitting broad applications of its research findings to the solution of practical problems--

¹Culbertson, op. cit., p. 268.

²Philip H. Coombs, The World Educational Crisis: A Systems Analysis (New York, Oxford, 1968), p. 4.

only then the stage was set for a significant development of planning. The role of planning in adapting research findings to policy problems applies both when aiming at policy change as well as consistency control. Although the growth of the social sciences cannot be said to have directly caused the recent demand for planning, it has made the development of planning possible by providing the planner with the main instruments for his work. And planning has proved to be an effective way of bringing the vast resources of research to bear upon government policy-making and administration.¹

Priorities and Resource Allocation Planning. -- This type of planning is essentially economic. It is concerned with establishing priorities within an educational system for the tasks which need to be accomplished and then assigning resources to the achievement of the tasks. Within the educational system Sanders acknowledges the following resources:

1. The presence of pupils for established times.
2. Services of teachers.
3. The specifiable fixed facilities.
4. The specifiable learning equipment.
5. The services of non-instructional personnel.
6. The uses of specifiable fixed facilities for non-instructional purposes.
7. The use of non-instructional equipment.²

¹ ibid., p. 32.

²Donald P. Sanders, "Toward a Theory of Educational Development," Comparative Education Review, XIII (October 1969) p 276 ff.

McCusker and Sorenson suggest that a resource combination that yields the most favorable overall relationship of benefits to cost ...will be one that allocates more than the usual amount of funds to the acquisition and servicing of instructional materials, and provides a cadre of specialized instructional assistance to the professional staff.¹

They suggest further that an allocation of resources based on the evaluation of the system's performance may in fact change the present use of resources. It is important, however, that:

- (1) "the possibility of alternative allocations be recognized, and
- (2) that the alternatives be compared systematically with one another so that the selection of the most promising arrangement can be made analytically and rationally."²

Love and Kyle have analyzed school systems in terms of the investments which may be made in these school systems. Since their work was primarily devoted to improving education in under-developed countries, they see a necessity for the nation to invest capital in these aspects of the total educational system:

- (1) teacher training;
- (2) students (tuition and related school costs);
- (3) buildings;
- (4) other facilities;
- (5) teaching methods (for improved use of extant teaching staff);
- (6) program materials

¹Henry F. McCusker Jr., and Philip H. Sorensen, "The Economics of Education," The New Media and Education: Their Impact on Society, Peter H. Rossi and Bruce J. Biddle, eds., (Garden City: Doubleday Anchor Books, A604 1966), p. 224.

²ibid.

(in support of the teaching staff or to conserve the teaching staff); and (7) technological teaching aids.¹

Priorities and resource-allocation planning offers alternatives for the use of scarce resources. Determining which alternative mix is effective for a given school system depends on the goals of the system, the resources available to it, and the relation of the use of these resources to other programs. Alternative resource allocation planning is usually achieved at the national level, and these techniques are only rarely applied in a local school district.

Human Resource Development Planning. -- Human resource development planning incorporates on a national level the fields of manpower planning, development planning, health and welfare (general social) planning, and educational planning. This area is generally only poorly defined. Davis points out that "no general model or set of models which describes, explains, or predicts how a society develops its human resources by educating and training its members" has yet been developed.² Nevertheless, this kind of

¹ Roy E. Lave Jr., and Donald W. Kyle, "Application of Systems Analysis to Educational Planning," Comparative Education Review, XXII (February 1968) pp 39-56.

² Russell C. Davis, Planning Human Resource Development: Educational Models and Schemata (Chicago: Rand McNally, 1966) p. 276.

human resource planning requires considerable attention. The OECD has sponsored a number of studies in developing and underdeveloped nations following in general the human resource development approach. Two basic steps in this planning methodology are now evident:

1. On the basis of a development plan or a systematic assessment of future levels of economic activity where no plan existed, production targets were established for the economic sector.
2. These occupational targets were converted into educational qualifications to yield an indication of total employment distributed by levels and types of educational achievement.¹

Chirikos and Wheeler conclude that "if a nation is interested in planning improvements in the quality of its labor force, the almost exclusive use of manpower criteria for designing educational policy and even other programs such as health seems to be unavoidable."² On the other hand, Davis argues with equal eloquence that

education cannot be planned in a one-to-one correspondence to work force requirements. The relationship between education and production is to indirect: Education may increase production, lower it, or be irrelevant to it; and education does more than merely enhance a man's productive behavior. Educational planning in terms of work force requirements provides some minimal estimates which are useful for planning, but work force requirements can never control all educational target setting."³

¹Thomas N. Chirikos and A.C.R. Wheeler, "Concepts and Techniques of Educational Planning," Review of Educational Research, XXXVIII (June 1968) pp 264-276.

²ibid., p. 276.

³Davis, op. cit., p. 22.

It appears, therefore, that human resource development planning has been most useful in underdeveloped nations. Only inadequate attention has been paid to this methodology in the United States, primarily because of the multiplicity of educational goals assigned to the system of public schools.

Applications of Technology to Education.-- Carpenter has provided the most thorough analysis of the requirements for appropriate planning of the applications of technology to education. He enumerates seven practical guidelines based on an approach of "fitting the general systems models to known examples of technological introductions:

1. The introduction of significant changes in a component part of a system leads to many kinds and degrees of changes in the entire system; significant components do not change independently of the whole system.
2. Semiclosed systems are very selective for kinds and amounts of influence or forces which have potentials whether actual, sensed or perceived -- for effecting changes in the system. The selection processes have many forms of expression: accepting and integrating new developments, accepting and isolating them, and rejecting them partially or entirely. Innovations require changes also in these selection mechanisms.
3. Regulations of the ratio of the amount of new energy or the amount of change influence relative to the total size of the system---the "critical mass" factor--importantly affects the character of successive change states. The rates of input and the assimilation of that which is new relative to

the total size affects the stability of the system...

4. Small peripheral "inputs" which act over short periods of time and in subordinate parts of a system are not likely to produce significant restructuring of the system or to modify its directionality and rate of accomplishment productivity. The "inputs" which are perceived to be too different or non-congruent with the established operating system are most likely to be rejected.
5. Accepted innovations that are significant require redefinitions of patterns of responsibilities and performance of all of the membership of an institution, and therefore retaining and readjustment of roles are necessary parts of effective innovative strategies ...
6. Innovations that require marked changes in roles and responsibilities of staffs or faculties also require realignment and adjustments of assessments of professional performance and changes in the rewards and incentives systems of educational institutions.
7. There are also operating, contingent to innovations, processes of gradual deacceleration or "entropy." These processes tend to reject the new and to restore the traditional. Innovations may be perceived as threat to established statutes, social ordering and learned skills, and these threats increase the already high levels of insecurities of staff or faculty members.¹

The controversy over the application of technology to education has resulted in a debate which perhaps casts more heat than

¹ C.R. Carpenter, "Society, Education and Technology, Part Two: On Planning Developments in Education," Planning for the Effective Utilization of Technology in Education, op. cit., pp. 21-22.

light on the problem. Oettinger, one of the severest critics of the use of technology in education, nevertheless offers this worthwhile summary:

The introduction of technology into education is an age-old process alternately exhilarating and depressing. The vastness of prevailing ignorance about both education and technology is matched only by the acrimony of debate about the value of educational technology, a debate blighted by a persistent confusion of ultimate promise with immediate possibility. Scientists or engineers who believe that quick but expensive technological remedies are all that's needed to cure education confront businessmen and school board members at ease with the status quo and anxious only to keep both the budget and the kids in line. Teachers are helpless in the middle.¹

Instructional Planning.--The Texas educational agency

defines instructional planning as follows:

Instructional planning is a systematic and continuous process designed to solve current and long-range problems and influence the direction and rate of educational change. Its first steps are to define and describe educational problems--in order to set goals for planning--and to gather pertinent information about problems and identify resources available to deal with them. The next steps in instructional planning are to design alternative solutions to problems and then decide which alternative to implement. The final steps of the procedure lead the planners back through the planning process again, but armed this time with information about the results of activated plans gained through their evaluation.²

¹Anthony G. Oettinger with Sema Marks, Run, Computer, Run: The Mythology of Educational Innovation, Harvard Studies in Technology and Society. (Cambridge, Massachusetts: Harvard University Press, 1969), p. 39.

²Texas Education Agency Office of Planning, Bulletin, mimeographed, April 1967.

The increasing complexity of learning systems brought about by the new technologies means that greater planning and control must precede the student's encounter with the learning situation. The explicit development and implementation of teaching strategies becomes the primary planning function. If the strategies are to develop autonomous learners, Costa finds that they will be based on relevant data and theories concerning:

Information about the learner--his characteristics, interests, past experiences, and needs.

Past experiences of the teacher--what has worked, what hasn't.

Constraints, limitations, and contents of available materials.

Theoretical understanding of how learning, motivation, reinforcement and transfer take place.

The logical sequence of learning tasks--what must have been learned prior to the next learning.

Expectations, values, and directives, of the school administration, the community, and the district.

The child's development--physically, emotionally, and cognitively.¹

The potential envisioned for machines and human teachers in combination remains far more exciting than fearful. Nevertheless with Joyce, we would like to:

¹ Arthur L. Costa, "Strategies for Developing Autonomous Learners," Audiovisual Instruction, 13: 8 (October 1968) 821.

Imagine an education, for example, in which the student teaches himself many skills by self-instructional materials using strategies derived from the analyses of those skills; engages in scientific inquiry with the guidance of teachers using strategies derived from the disciplines; studies his society with other students who teacher-leaders operate from conceptions of desirable social processes; meets with a counselor who tries to arrange an educational environment appropriate to his personality; and selects electives from a storehouse of instructional systems which are built around a range of strategies matched to his ability, experience, and learning style. Now wouldn't that be something.¹

THEORETICAL BASES FOR EDUCATIONAL PLANNING

This section will attempt to discuss some theoretical bases requisite for educational planning. While the preceding section dealt with definitions and parameters of planning activity it is now appropriate to develop planning as a dynamic activity composed of a number of discrete steps and organizable along a time continuum. A brief description of systems analysis procedures will be undertaken, along with a discussion of the step-by-step process, followed by a discussion of various educational planning models. The section will present an integrated planning model which will form a bases for organizing the planning process.

¹Bruce R. Joyce, "The Development of Teaching Strategies," Audiovisual Instruction, 13:8 (October 1968) p 821.

Systems Analysis

System analysis is an orderly process for first, defining and describing a universe of interest (and the significant factors and their interrelationships within the universe); and second, determining what changes in the universe will cause the desired effect. Systems analysis generally begins with the broadest statement of the universe and then isolates and defines the parts of the system according to their function, noting the interrelationships among these functions. Sackman describes systems analysis in terms of a deductive-inductive reasoning process:

System development up to a point resembles a progressive deductive process proceeding from very general to minutely partitioned levels. The deductive path runs from statement of the problem, to system description, to operational specifications, to program specifications and transfer functions, to flow diagrams, and finally to the coded program manuscripts. This process is a stepwise act of creation by successive subdivision of the system concept into its elements...The initial products, in turn, reverse the deductive trend and indicate an inductive process in which small pieces are successfully assembled into larger components and subsystems....¹

Thorne and Willard indicate that a systems analysis should start at the highest and most general echelon of cognizance and authority to determine the boundaries of the overall system; proceed to define the system, in stages of increasing detail, translating functional requirements into specific

¹Harold Sackman, Computers, System Science, and Evolving Society: The Challenge of Man-Machine Digital Systems (New York: Wiley, 1967), pp. 280-281.

requirements for material, etc.; and not prejudice the solution by conjecture.¹

They analyze the advantages of the systems approach in the following manner:

the system approach is an orderly way of appraising a human need or complex nature, in a "let's stand back and look at this situation from all its angles" frame of mind, asking oneself:

How many distinguishable elements are there to this seeming problem?

What cause and effect relationships exist among these elements?

What functions need to be performed in each case?

What trade-offs may be required among resources, once they are defined?

We have said that the Systems Approach is suitable for assessing the challenges of a broad scale or ... challenges of (a) magnitude ... characterized by the following orders of difficulty:

A complex goal (involving a major system composed of hardware, computer programs, facilities, personnel and data).

A constantly changing environment (which affects objectives, constraints, and criteria)

Limited resources for advanced development (money, manpower, facilities, and time).²

¹P.G. Thome and R.G. Willard, "Systems Approach: A Unified Concept of Planning," Aerospace Management, Fall-Winter 1966 in Scientific Manpower Utilization, 1967. Hearing before the Special Subcommittee on the Utilization of Scientific Manpower, United States Senate. (Washington, D.C.: Committee on Labor and Public Works, 1967), p. 278.

²Ibid.

These brief comments on systems analysis do not yield a complete description of the area, a task believed to be beyond the scope of this paper.¹ While the area has remained controversial, especially in the application of systems procedures to education, the comprehensive, step-by-step, total planning process inherent in systems appears to offer educators these advantages:

1. A way of viewing large problems within a productive prospective.
2. The effective organization of the parts into meaningful systems for dealing with problems.
3. The effective application of resources based on alternative organizations.
4. A context for understanding the constraints imposed upon the institutional structure of education.
5. A group of planning techniques which makes possible large-scale, long-range planning.
6. An interdisciplinary, problem oriented approach to research and development.

On the other hand, systems procedures can be no magical scientific savior for the complex problems implied by technology.

¹A broad literature exists in this field, although little work has been directly applicable to education. Worthwhile introductions include: Sackman, op.cit.; Systems Analysis for Education Planning (Paris: Organization for Economic Cooperation and Development, 1969); A Modern Design for Defense Decision: A McNamara-Hitch-Enthoven Anthology Samuel A. Tucker, ed., (Washington, D.C.: Industrial College of the Armed Forces, 1966); and Frank W. Banghart. Educational Systems Analysis (New York: MacMillan, 1969).

Some important limits include:

1. Systems procedures cannot show ways to operate below certain necessary minimums.
2. They cannot remove the constraints imposed by insitutional force, but they may suggest ways to work around them.
3. Systems analysis cannot compensate for a lack of clear-cut purpose or for a confused operational philosophy.
4. Systems analysis cannot provide simplistic procedures for arriving at incontestable conclusions.
5. There can be no guarantee that procedures developed in one discipline will be automatically transferable to another field.
6. Systems analysis cannot replace judgements.

A Step-By-Step Procedure

The process of systems analysis can be defined as made up of several distinct steps. There is no general agreement as to the number of steps in this process, although the tasks are usually organized in a consistent order. Henrie and Bailey suggest the following six steps in the process:

1. Clarifying goals.
2. Defining objectives.
3. Defining missions and analyzing them as tasks.
4. Sequencing tasks.

5. Setting up a management system.

6. Setting up an evaluation system.¹

The process of systems analysis is not straightforward or linear. Many processes interact, and feedback from any point can force us to reexamine an earlier step before proceeding further. In this respect, the following listing of basic steps seems useful:

Step I : Conceptualizing the system or the "problem universe";

Step II : Defining the subsystems;

Step III: Stating the objectives of the system;

Step IV : Developing alternative procedures for achieving the objectives;

Step V : Selecting and implementing the best alternative; and,

Step VI : Operating the system.

Figure 2, based on these six steps shows the basic system methodology as developed over the past 20 years. Note that the system begins by explicating boundaries of the system and problems envisioned by the analysis. It proceeds then to a system description and a statement of systems requirements. The next step on this chart shows the basic subsystems divisions usually

¹Samuel N. Henrie Jr., and Higgins D. Bailey, "Planning Carefully or Muddling Through: an Educator's Choice." Journal of Secondary Education, XXXXIII (December 1968) pp 349-352.

FIGURE 2 - a

A METHODOLOGY FOR DESIGNING ALTERNATIVE SYSTEMS

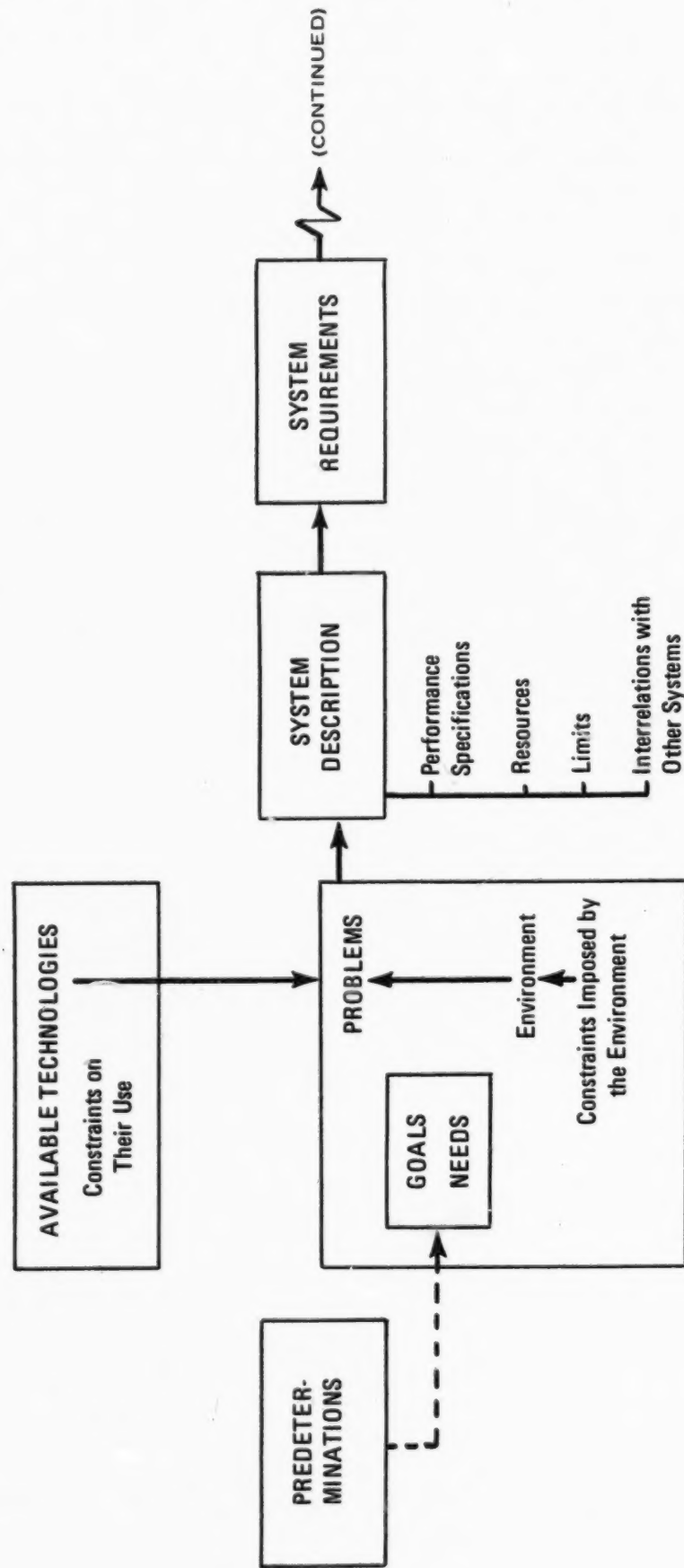
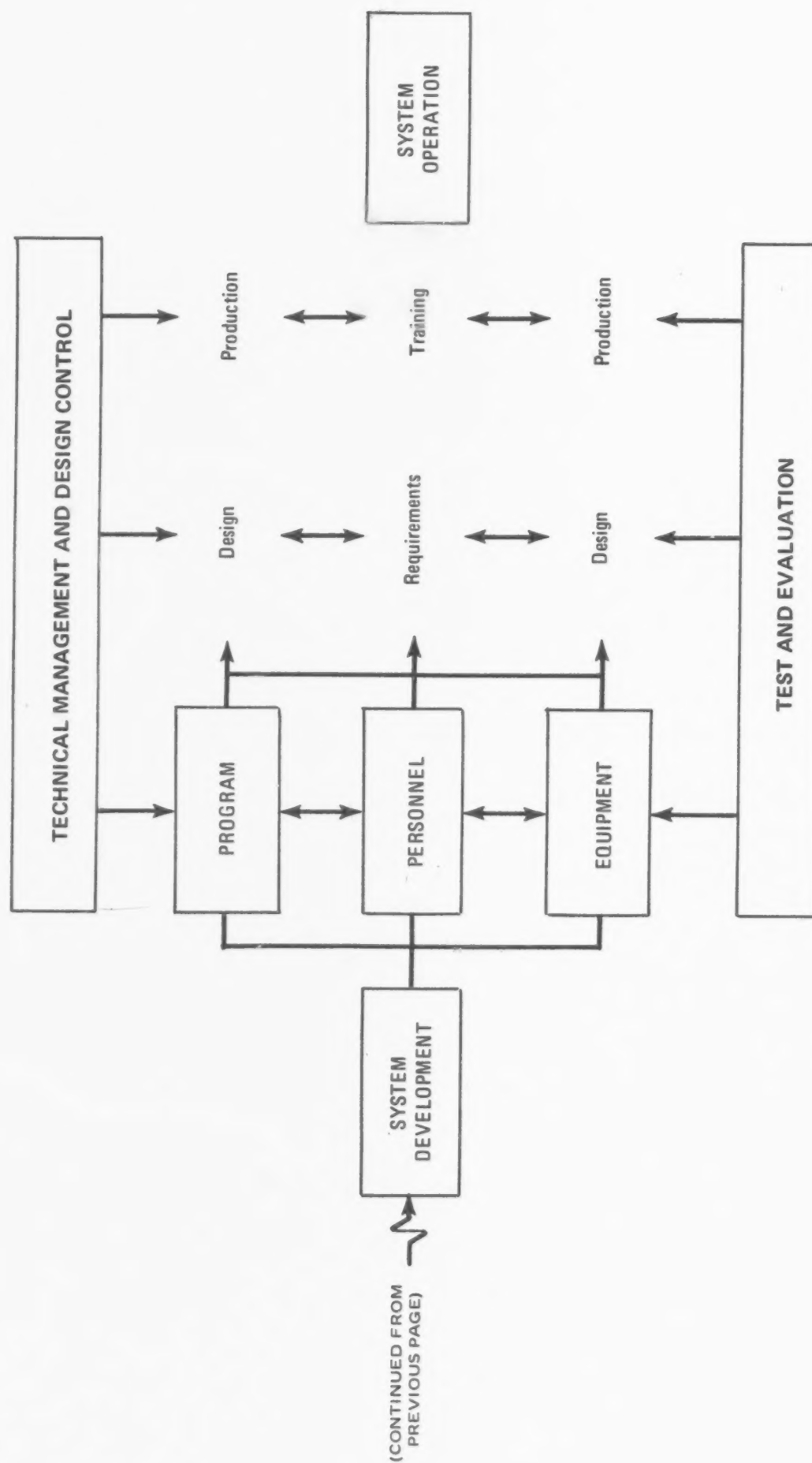


FIGURE 2 - b
A METHODOLOGY FOR DESIGNING ALTERNATIVE SYSTEMS



(CONTINUED FROM
PREVIOUS PAGE)

recognized in system planning: program, personnel, and equipment. These three subsystems undergo design and production phases, both of which are mentioned by programs of management or evaluation. These management and evaluation systems govern the operation of the system when that stage is eventually reached.¹

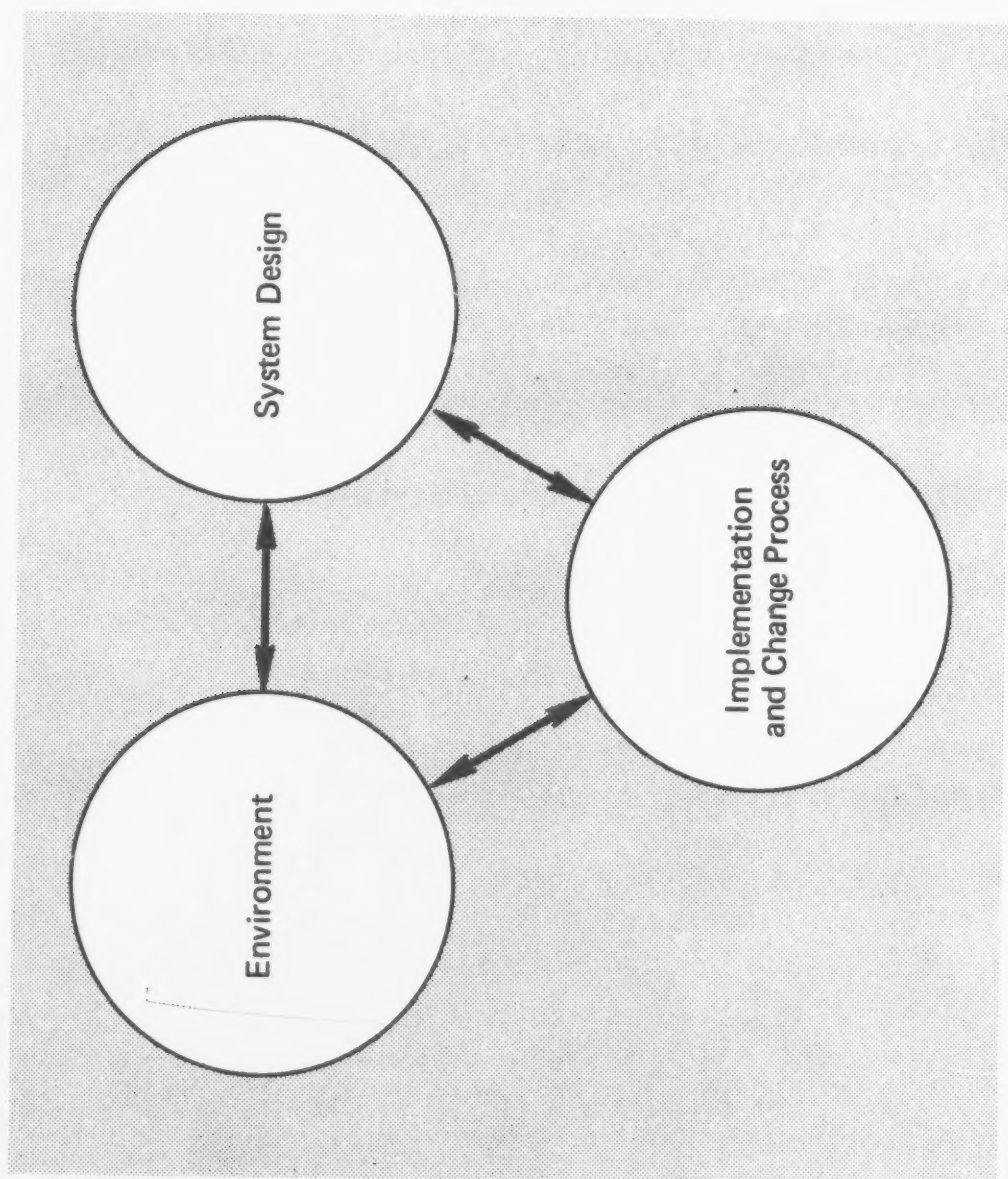
Aspects of Total Systems Planning

The effective application of systems procedures in education should be viewed from a perspective which sees the total design process as composed of three interrelated but distinct aspects. These are the task of systems design, the analysis of the system environment, and the change or implementation process. Figure 3 shows how these relationships can be explained graphically by imbedding each of these elements within a circle and enclosing these circles in a box. Between each circle is a two-headed arrow indicating the necessary intercommunication among the elements.

The system design process has yielded highly sophisticated engineering systems, but this process has not been functionally interrelated to either the system environment or the change and implementation process. The systems approach begins with a premise that the educational enterprise achieves its apparent objectives

¹See Sackman, op. cit., Chapter Five, "System Development and System Testing," pp. 171-216.

FIGURE 3
THE TOTAL DESIGN PROCESS



primarily through people, rather than through machines. Furthermore, the systems approach of industry must be modified if it is to serve school enterprises properly, since industrial organizations generally utilize rigid barometers to indicate degree of success and failures--such as profit or loss statements, measurement of tangible products, and quality assurance standards--while school systems have generally operated in the absence of such definable criteria. Basic to the entire concept of systems procedures when applied to the educational environment is a belief that if the systems concept is to be helpful to educators, it is important to recognize that schools exist primarily to facilitate goals related to student learning.

If education is thus regarded as a system, it clearly follows that problems neither exist nor can be solved in isolation from the total system; and the system's environment must also be considered, since the environment is the primary location of both system constraints and system resources. The environment includes both the explicit and the implicit political, economic, and social forces which impinge on the system. It causes system problems, and it can also provide problem solutions. For instance, suppose a program of training, emphasizing child growth and development, were provided for all expectant mothers. Such an alternative might

produce greater results than similar expenditures for additional preschools, for nursery-level educational television, or for some other scheme. This essentially educational program, however, while affecting the K-12 input and thus the educational system would require changes in areas beyond the limits of the ordinary school system, as well as adaptive changes within it.

The literature on change and implementation appears to be growing at leaps and bounds both within and outside the field of education, and the development models has improved the evaluation effort. Feedback relating input and output is beginning to yield some effective observations of educational programs. It may be too soon to place strong faith in analyses of critical factors and predictions based upon them, but they have certainly become useful and important guides to judgement.

These three areas, the system design, the system environment, and the change process, have not received sufficient attention as integral parts of a single process for discovering and implementing educational improvements. As a result there is little compatible information on which to develop the potential effects of changes in one aspect of the total process or the whole process. For instance, evaluating whether to change the system or to redefine the environments can seldom be adequately handled by present tech-

niques of experimenting, both because essential factors are not always known, and because alternative environments in education are seldom considered.

Levels of Educational Planning

The preceding section made clear that a total planning system must include several elements. It is also necessary to emphasize that educational planning occurs at a number of "levels." Indeed, many difficulties in planning occur from confusion about the level at which the planning is taking place. For instance, a federal mandate (as evidenced through the NDEA, 1958) to supply great quantities of technological gadgetry to the schools made excellent good sense in terms of the necessity for expanding certain industrial sectors of the economy. The same decision, however, appears to have been justified when considered at planning within the schools.

In attempting to clarify the various levels of educational planning, Figure 4 defines seven such levels and suggests major "inhibitors" for each. Specific planning tasks can then be defined at each level and specific organizations of the planning function can be recommended.

FIGURE 4 - a

SEVEN LEVELS OF PLANNING

LEVEL	DEFINITION OF TERMS	INHIBITORS OF THE SYSTEM
The Mandate	Within the community exist forces which arise as the result of perceived needs of the community. One such expression is "education." This force then is generally expressed in four ways: 1. <u>Philosophical</u>: the good of the mandate 2. <u>Societal</u>: the legitimacy of the mandate 3. <u>Political</u>: the active value of the mandate 4. <u>Economic</u>: the power of the mandate If no such expression exists within the community, one must be created by leadership - a relatively autocratic viewpoint, or the area may be considered not worthy of attention. The increasing concern for "poverty" and "integration" are examples of changing mandate.	<u>Philosophy</u>: amgiguous, unclear, missing <u>Society</u>: no clear felt need for education (i.e., only indoctrination, or some other form of initiation) <u>Political</u>: Lack of viable consensus <u>Economic</u>: lack of resources or lack of appropriate allocation of resources
The Mission	The forces of mandate organize themselves into an expression of the force of the mandate, the population affected by the mandate, the direction of the mandate, and the reason of the mandate. The sum of these statements expresses the mission. Each of these areas requires explanation: 1. <u>Force of the Mandate</u>: such expressions as "our democratic obligation," "the American responsibility," "the white man's burden," or "the Christian's duty," represent the expression of a mission's force. Less emphatic expressions may be found, for instance, "when resources are available," "the worthy aim of elimination of poverty must wait the return of peace," and "the cause is noble." Without adequate force a mission will fail. 2. <u>The Population</u>: a mission concerns a population by eliminating nonparticipants. The democratic obligation affects only those who can accept a mission as obliging their democratic sensitivities. Population is stated by the creators of mission or arises as a concomitant of mandate. To some extent population adds force by requiring entrance or focusing efforts. 3. <u>Direction of the Mission</u>: education seeks to provide the good man. Direction indicates where a mission will lead, and a mission must encompass distance or atrophy. For education, the direction of mission depends on a belief in the improvability of man through growth in such a way as to make life more meaningful. The Cardinal Principals are valuable statements in this sense (and perhaps in this sense only).	Omission of operational acceptance makes mission only idle banter Force implies willingness of the individual to accept without coercion; otherwise the mandate loses its effect Insufficient numbers adhering to the mission, or adhering to essentially conflicting or competing missions, weakens the potential consensus and the potential strength through dedicated numbers Lack of direction causes dissipation of resources, anomie, and cynicism. Chief inhibitors are failure of consensus, lack of dedication, confusion about means, competition among power groups and means, and stability maintenance and defense mechanisms preventing growth and change

FIGURE 4 - b
SEVEN LEVELS OF PLANNING
(CONTINUED)

LEVEL	DEFINITION OF TERMS	INHIBITORS OF THE SYSTEM
The Mission (CONTINUED)	4. <u>The Reason of the Mandate</u> : a mission appears reasonable because of the obvious inability or inadvisability of life to continue otherwise. The improvability of man through education provides the vehicle for human attainment.	Lack of drive, self-satisfaction (on a societal level), insistence on "crash" programs or emergency conditions to provoke action, and philosophic confusion detract from the reason of the mandate. The chief inhibitor of mission is ennui.
Aims and Goals	Aims are generalized sub-divisions of the mission. As such, they should be consistent with the statement of mission and capable of being justified by reference to the sense of mission. Goals, then are specific, frequently measurable, statements emanating from the aims. Both aims and goals can change without changes in the mission, but a change in aims and goals will affect the means, tasks, skills, and techniques. A twelve year education for everyone may suggest a desirable aim, but if the mission is to provide an educated man, the aim may not fulfill the requirements voiced by mission.	Lack of consensus for establishing priorities inhibits operation. The inability to express viable aims and/or workable goals prevents development of a system.
The Means	Means is used here to indicate the institutions of education. The word causes some problem. Means are appropriate for aims and goals or they fail to meet the aims and goals. It is the force of institutions that they seek to protect themselves when aims and goals change and render them obsolete or ineffective. In this sense institutions possess a force not attributable to aims and goals, whose redefinition can be prevented by institutional power.	Poorly defined institutions result from the lack of sanctioned purpose. The schools, then, are in a state of flux, drifting rather than directed to a task. Adjustments of the system for the convenience of the means subjects aims and goals to the requirements (needs and institutional force - usually defensive) of the system and prevents adjustments necessary to align the system with change.
The Tasks	The programs operated by institutions should stem from the requirements of the aims and goals. Appropriate tasks should be assigned to appropriate institutions, within a field of awareness of the full number of institutions addressing a mission. Tasks can be organized by the nature of the human involvement and judged appropriate by their success in achieving aims and goals within the context of the means.	Programs become ends for themselves rather than building blocks for the achievement of aims and goals of high purpose (i.e., the inbreeding of academic success tends to further the aim of academic success rather than relating its meaning to a larger framework).
The Skills	Here is another troublesome word, but it is intended to encompass those things learnable which are required for the achievement of tasks, viz., the attainment of goals. We assume our well educated man (an aim) requires competence in the use of his native language (a skill). Skills may be of two varieties: content and method. One learns to read (method) in order to be well read (content).	Skills are necessary to permit the achievement of program. Skills cannot be more clearly defined, or adequately selected, than the program statements which guide their determination. Programs designed only to achieve skills are classed within themselves, unless the relation to higher aims and goals has been established (e.g., there is little purpose in learning to read unless print media are available and a natural (an accepted - mandated) item of the societal need.

LEVEL	DEFINITION OF TERMS	INHIBITORS OF THE SYSTEM
The Techniques	This area incorporates the whole methodology of achieving skill development. Technique is appropriate if it achieves skills in such a way as to further the aims and goals. Some techniques are destructive of the mission although they achieve the required skill. Regimentation, for instance, is found to be such a technique.	(Technique is useful when it promotes efficient, efficacious accomplishment of skill training for task accomplishment). Techniques promoted for their own sake, or as central to the system, destroy the system. This danger holds whether the supported technique is a philosophical system or a technological advance.

Models for Educational Planning

Many problems of educational planning can be understood through the development of educational models. Such models should be of sufficient complexity to define the system completely, yet of sufficient abstraction to permit the design of change. Models of the operating educational system--either process or institution-oriented--have not as yet been sufficiently developed. Indeed, their importance has only recently been established.

A successful model depends upon a representation of reality which is sufficiently accurate for the purposes of the planners and which takes account of alternatives. Successful model development is dependent upon the availability of adequate data, frequently over a period of time. Wurtel concluded his study of educational models in these terms:

The picture portrayed here is one of formidable theoretical and statistical obstacles to the development of adequate planning models. Though many of the models (analyzed for this study) are still in fairly exploratory stages the extensive current interest in such efforts may be some indication of a growing sense on the part of planners of the importance of such endeavors, and may provide some hope for significant theoretical breakthroughs in the not too remote future. Due to the complexity of the educational system (vast numbers of inter-dependent variables, complicated and not too well understood relationships, changing patterns), as well as the complex array of demands upon the system from other sectors of the economy, mathematical

models may evolve into indispensable tools for rational and consistent planning.¹

Concerned with applying scientific methodologies in the social sphere, Helmer describes the purposes and characteristics of modeling in these terms:

The purpose of constructing a model of a given situation is to select certain elements as being relevant to the problem under consideration, to make explicit certain functional relationships among the elements, and to formulate hypotheses regarding the nature of these relationships. A characteristic feature in the construction of a model is abstraction: certain elements of the situation may be deliberately omitted because they are judged irrelevant, and the resulting simplification in the description of the situation may be helpful in analyzing and understanding it. In addition to abstraction, model-building sometimes involves a conceptual transference. Instead of describing the situation directly, it may be that each element of the real situation is simulated by a mathematical or physical object, and its relevant properties and relations to other elements are mirrored by corresponding simulative properties and relations.²

There are many varieties of models. Some give only an impression of a universe and, as a work of modern art, may be communicable only to a small group. Other models may be carefully detailed and easily understood by those familiar with the symbol system. Presently there is a strong preference for models which

¹Zavia S. Wurtele, Mathematical Models for Educational Planning (Santa Monica, California: System Development Corporation SP3051 November 1967), p. 18.

²Olaf Helmer, Social Technology (New York: Basic Books, 1966), p. 7.

relate their parts by describing the information passing between them. These "cybernetic analyses" provide more operational or useful views of reality than the earlier mechanistic or biological models. The development of information models, especially those mathematically based, within the field of education is perhaps a task beyond the present "state-of-the-art."

All models, regardless of how abstract or concrete, have certain characteristics by which their usefulness may be judged; these include: (1) the model is complete; (2) the model reflects an operational reality; (3) the model is understandable; (4) the model encourages further analysis; (5) the model encourages feedback.

A useful model for purposes of educational planning could be evaluated on each of these five points. Helmer's analysis of the model's advantages is especially worthwhile:

The advantage of employing a scientific model lies in forcing the analyst to make explicit the elements of a situation he is taking into consideration and imposing on him the discipline of clarifying the concepts he is using. The model thus serves the important purpose of establishing unambiguous intersubjective communication about the subject at hand. Whatever intrinsic uncertainties may becloud the area of investigation, they are thus less likely to be further compounded by uncertainties owing to disparate subjective interpretations.¹

¹ibid, p. 8.

Educational planning models should include a macro-model for "education," another macro-model for the "schools," and appropriate micro-models for specific clusters of behavioral aims and goals. An "educational macro-model" should cover, broadly, all those aspects of changing behavior for which educational institutions are considered responsible. The school would select "goal areas" from the macro-model for education. Figure 5 indicates one macro-model system view of a program of education through the schools. The primary reason for developing such a model is to present an overview of the total educational system, and to interrelate specific planning missions. Thus a high level of system integration can be maintained.

Figure 6 shows another form of model begins with the individual student and traces the development of the curriculum, by relating content and method to the learner and the system's objectives.¹ This type of model facilitates the planning of programs based on (1) a theory of learning and the learner, (2) a body of knowledge appropriate to the goal, and (3) a selection of teacher-technology resources which facilitates achievement of the goal.

¹This model was developed during discussions with Stuart Westerlund, then in the Office of Planning and Evaluation, Bureau of Elementary and Secondary Education, U.S. Office of Education.

FIGURE 5 - a

THE MACRO-SYSTEM OF THE SCHOOL SYSTEM

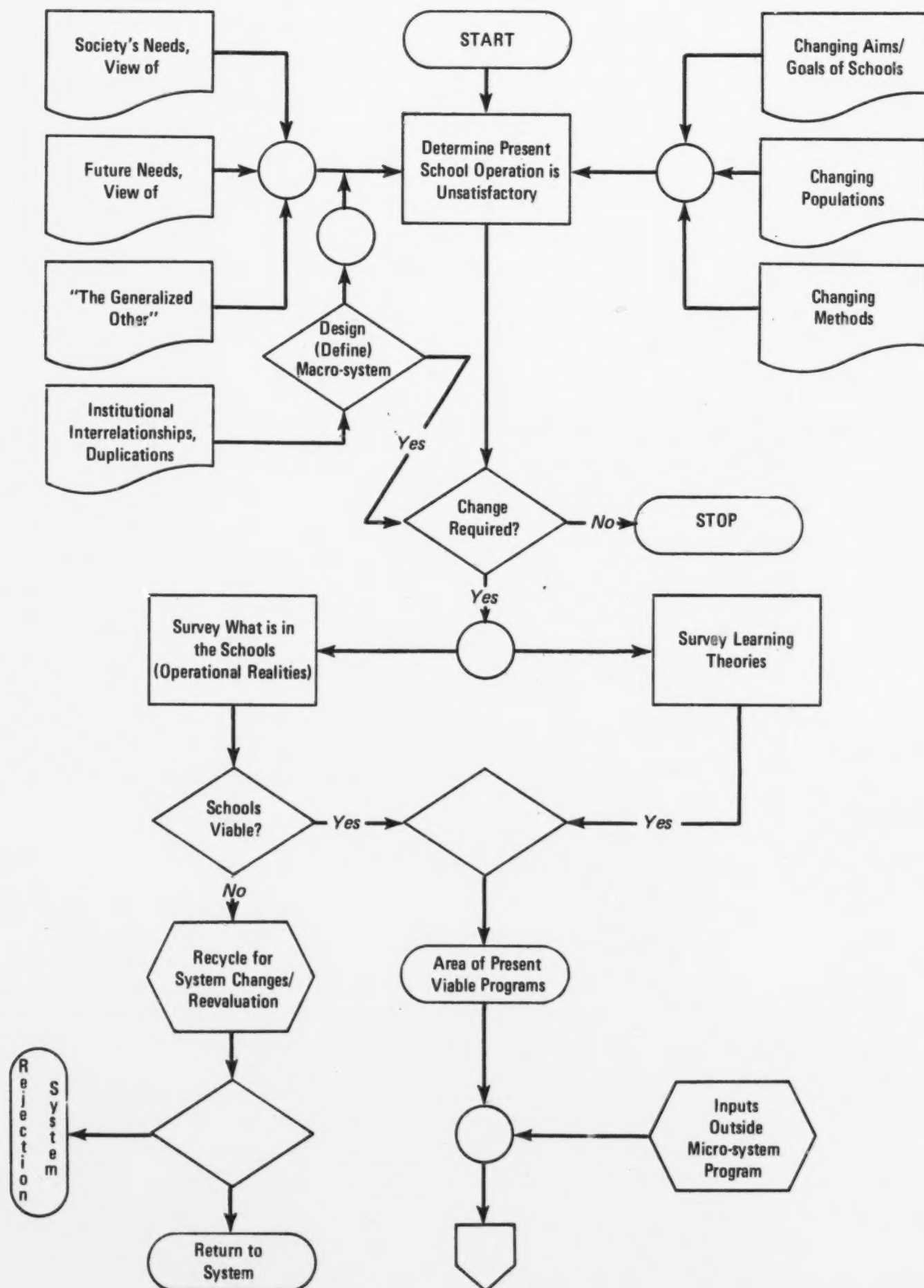


FIGURE 5 - b
THE MACRO-SYSTEM OF THE SCHOOL SYSTEM
(CONTINUED)

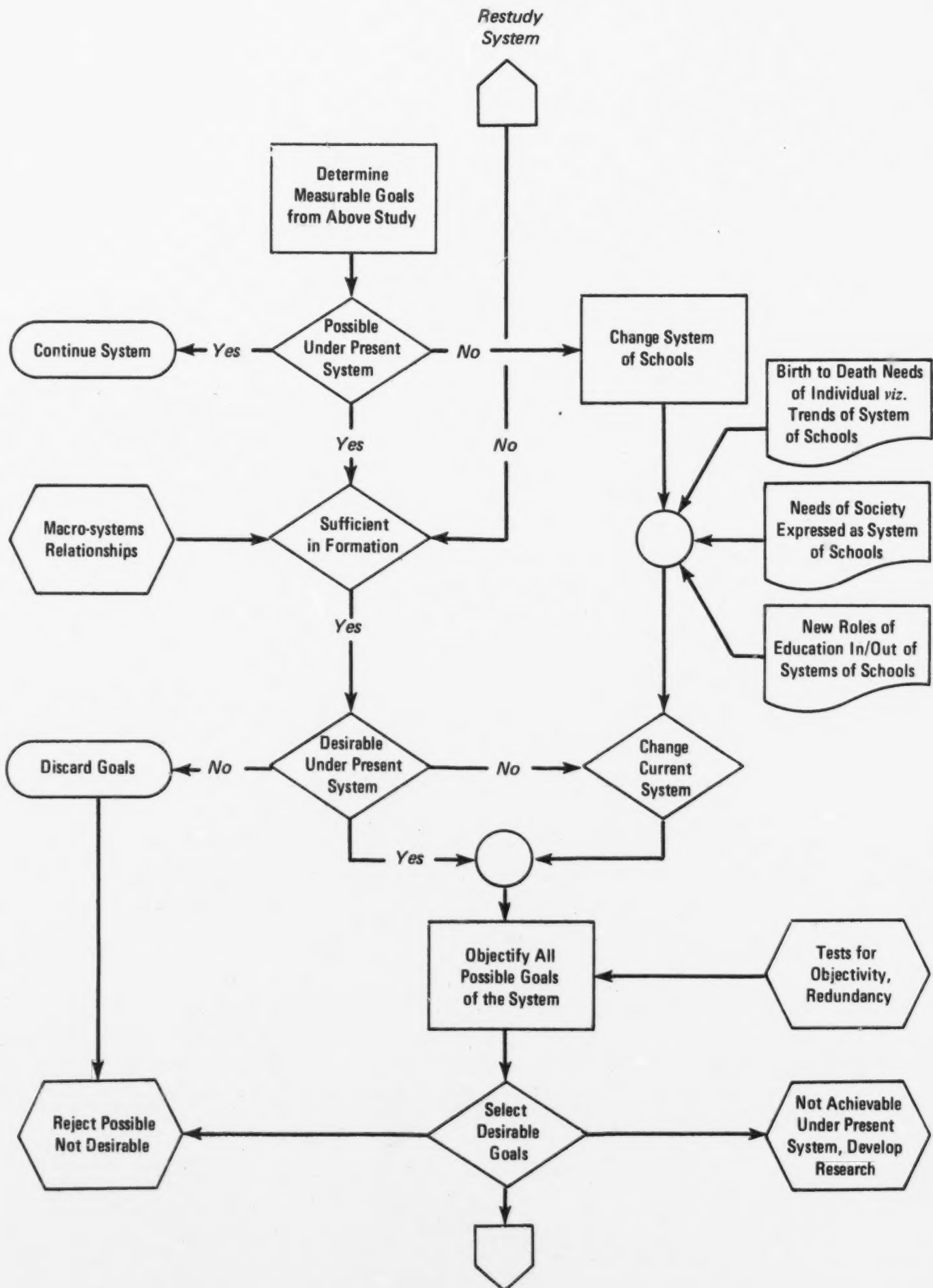


FIGURE 5 - c
THE MACRO-SYSTEM OF THE SCHOOL SYSTEM
(CONTINUED)

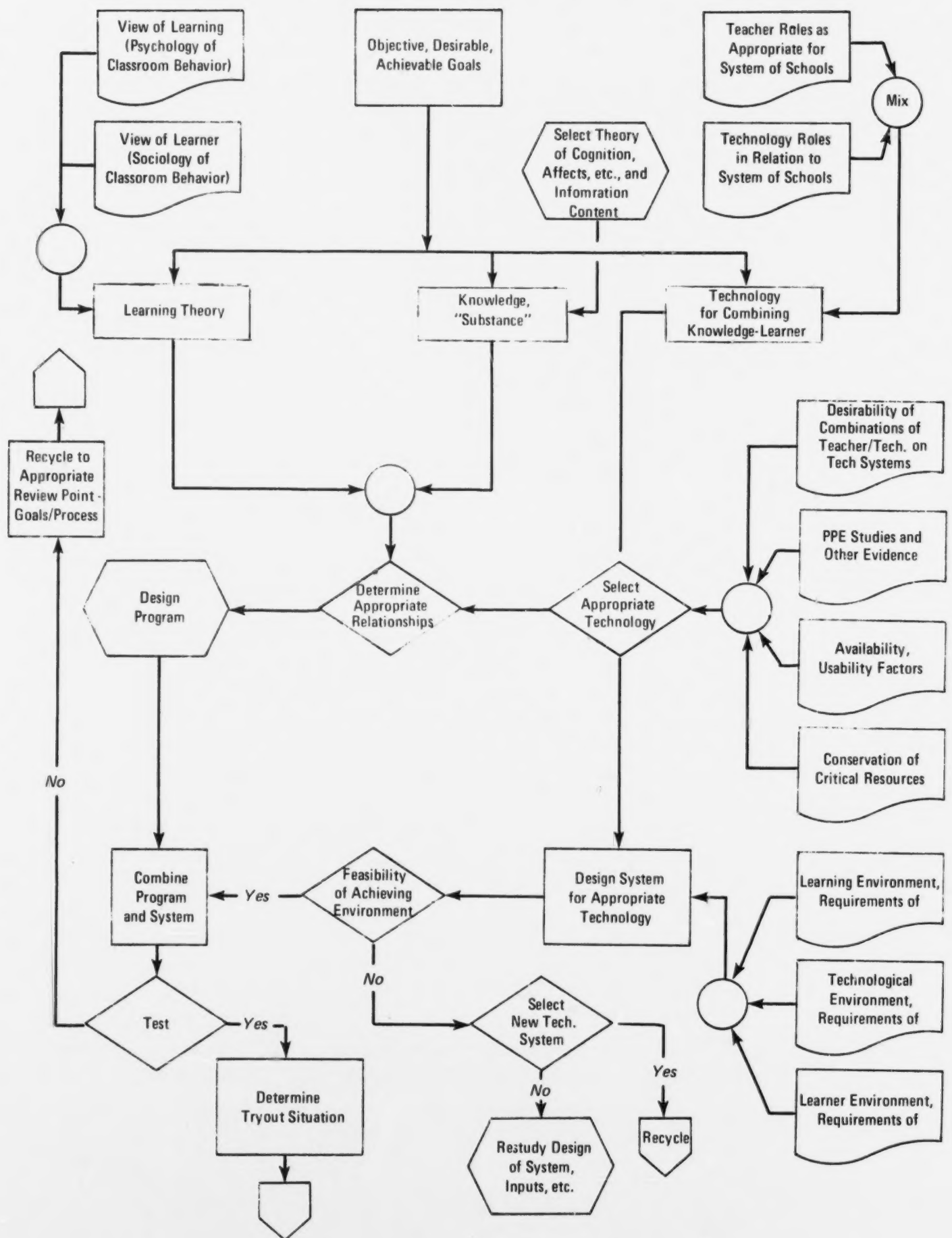


FIGURE 5 - d
THE MACRO-SYSTEM OF THE SCHOOL SYSTEM
(CONTINUED)

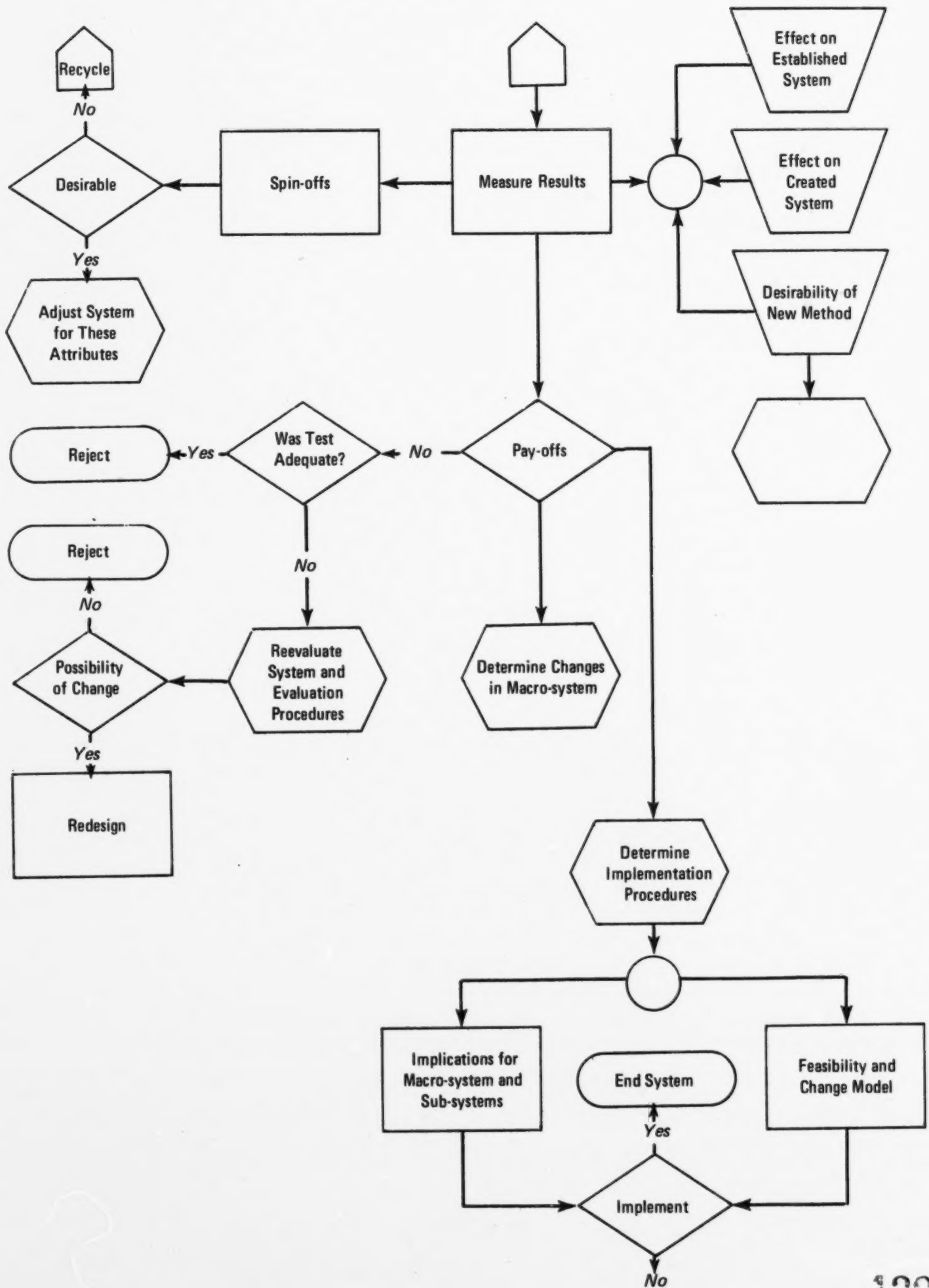
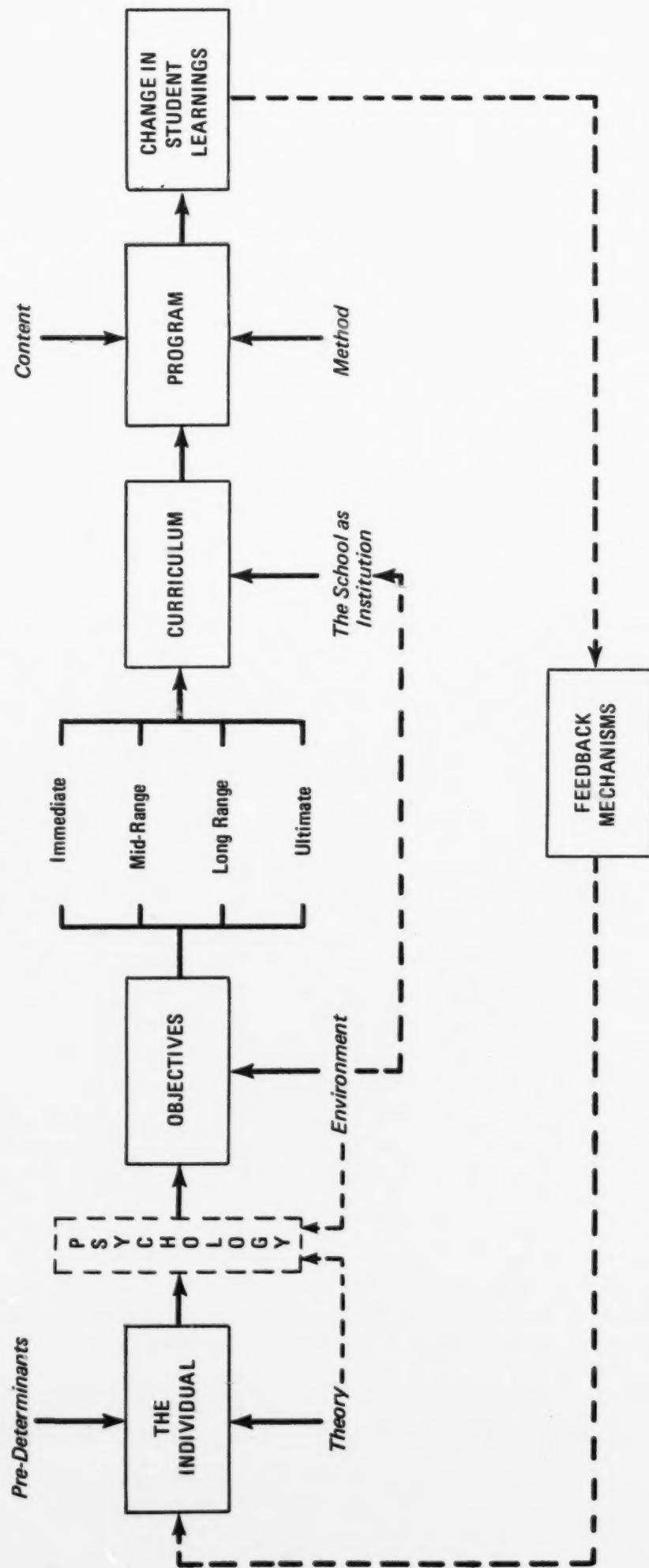


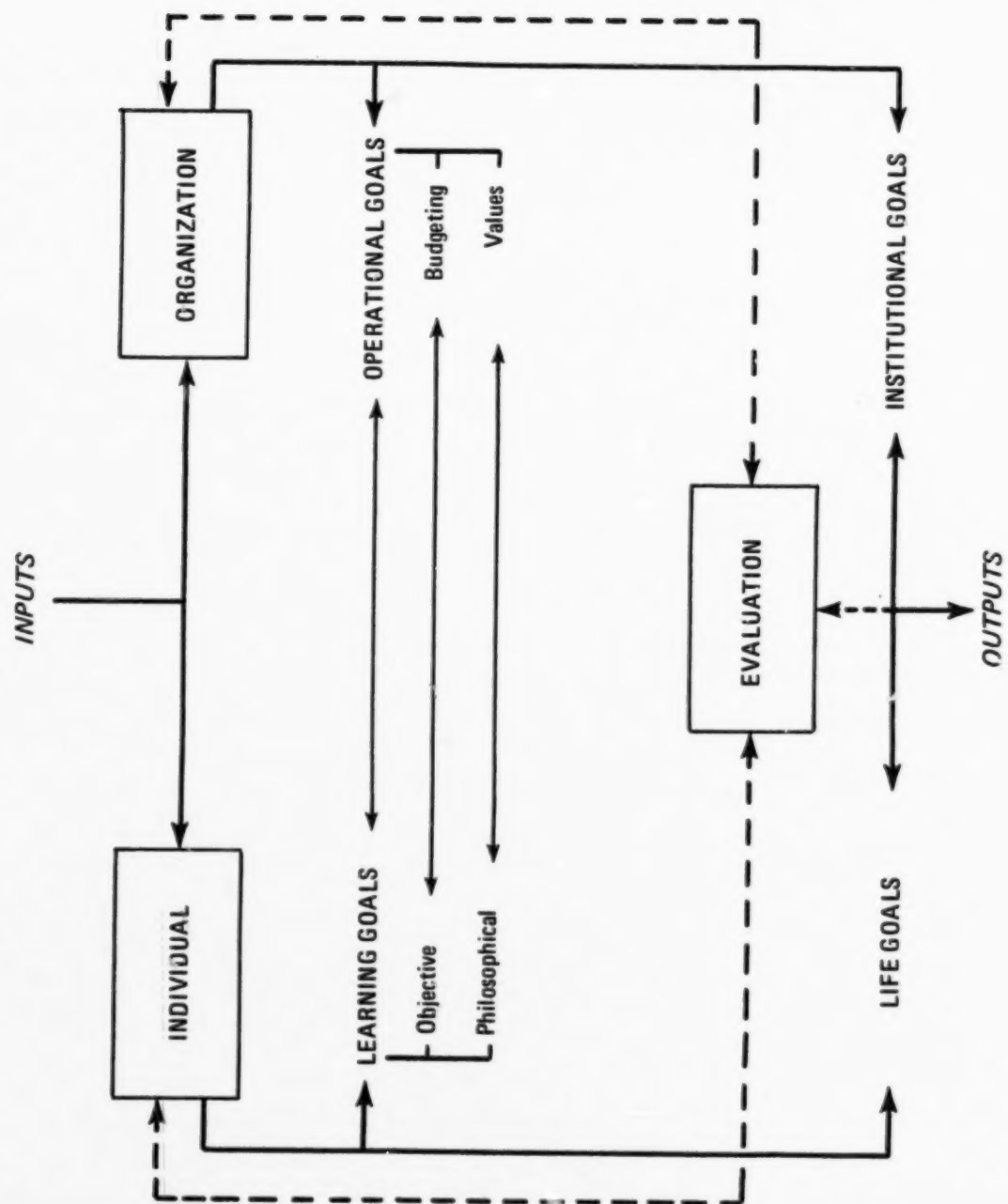
FIGURE 6
A FRAMEWORK FOR THE DEVELOPMENT OF
EDUCATIONAL LEARNER-BASED EDUCATIONAL PROGRAMS



The concern, however, rests not only with the individual but with a system of education which can effectively deal with great numbers of individuals. Any organization, however, because of its existence, has goals of its own. The organizational goals, if the organization is responsive, should operate in a clear dynamic with the goals for each individual within the system. This may not always be the case, and it has been strongly suggested that the schools have lost sight of their relationship with students through institutional rigidity, defensiveness, and a lowering of efficiency. Figure 7 posits a dynamic between these two viewpoints and suggests a mechanism for evaluating the degree to which each program is worthwhile.

No one model, it has been suggested, can adequately portray a system so complex as a school or a process so sophisticated as education. Subsystems, however, can be extracted from the gross-systems models and developed to indicate the significant aspects or features of the total system. The interrelationships of these subsystems, based on their effect on system goals, would relate the parts to the whole. The models provided for educational planning at this stage of sophistication would not be intended for mathematical simulations, but they could shed light on the form and substance of the system. It seems important for the "art of education" that the necessity to qualify all aspects be controlled.

FIGURE 7
RELATING INDIVIDUAL AND ORGANIZATIONAL OBJECTIVES



This form of model building appears to be basic for the process of comprehensive, long-range educational planning. Ackoff puts these activities in perspective:

It seems to me, one of the most practical things we can do in preparing ourselves for effective long-range strategic planning for an organization is to engage in the invention or design of an idealized form of that organization, an exercise that should ignore all apparently practical constraints. Once such a design has been completed, we can determine how closely it can be approximated and we can systematically plan the transition toward the ideal. However, we should not engage in designing an ideal without awareness of two essential characteristics of such an effort. First, our concept of an ideal will change over time, and hence our formulation of it at any moment of time is at most a relative absolute. Second, since our efforts at idealization are necessarily rooted in our own culture, any ideal that we formulate is not likely to be ideal in societies other than the one in which we have grown. Therefore, a formulation of an ideal is not only a relative absolute, it is also absolutely relative. One final general point: I am certain that one essential characteristic of an ideal university or an ideal business is that it would be continuously designing itself and would use controlled experiments to evaluate at least the important features of the redesigns. Therefore, if idealized design is a utopian effort, it is utopian with a difference: the utopia involved is dynamic and far from perfect but is capable of systematic progress toward that elusive ultimate ideal, perfection.¹

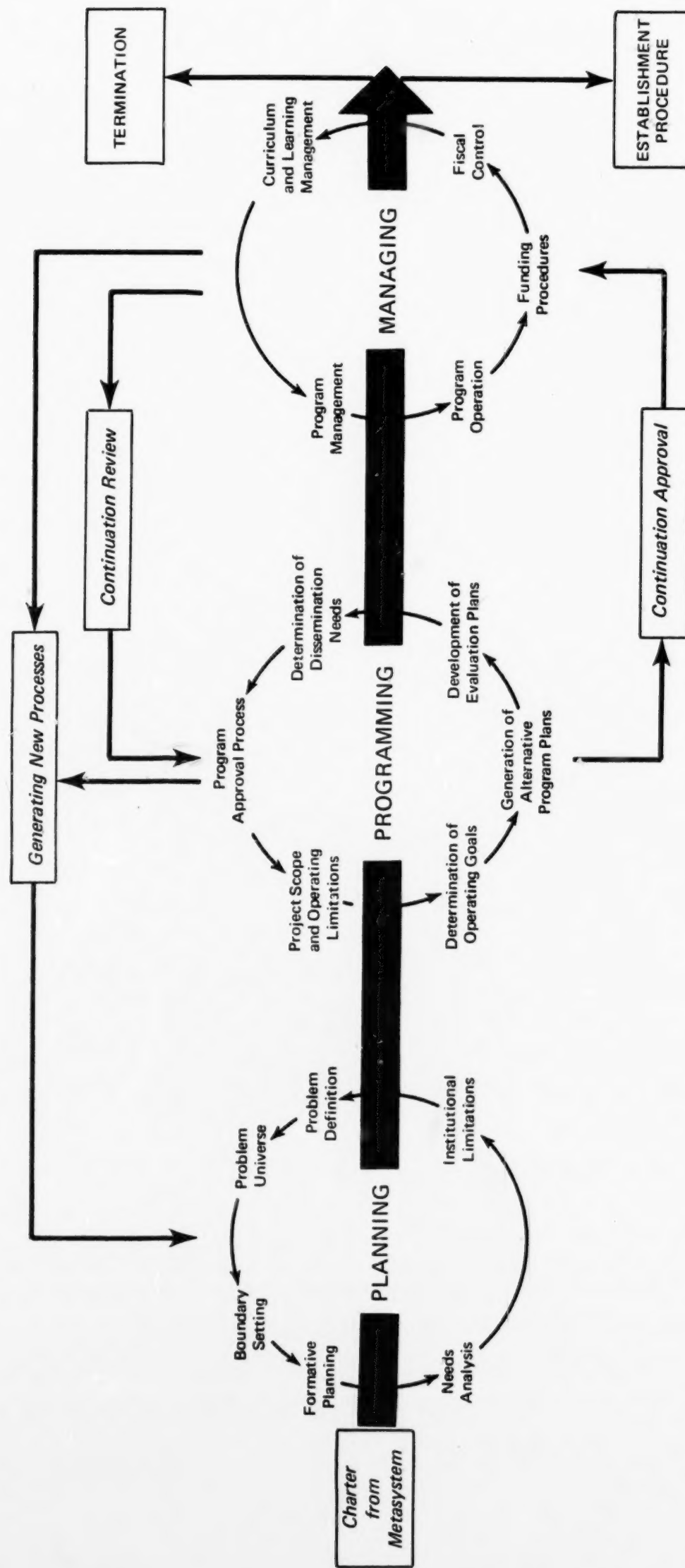
An Integrated Planning Model

A basic axiom for effective comprehensive, long-range planning is to avoid confusing part of the planning process with all of planning. Figure 8 presents a model which attempts to integrate

¹Ackoff, op. cit., p. 60.

FIGURE 8

AN INTEGRATED PLANNING MODEL



the various aspects of the planning process. This model is based in part on the PPBS (Planning-Programming-Budget System) work sponsored by the federal government and recently applied to educational planning.¹ It seeks, however, to go beyond the PPBS work by suggesting relationships between the program planning effort and activities outside of the model. It further seeks to link various types of planning orientations (i.e., manpower, priority, economic, etc.) and various specific planning activities as they occur in an on-going planning mission.

The model begins by positing a direction for the planning process, indicated by the black arrow running through the center of the process. At the left extreme are indicated the chapter from the meta-system, that is, the forces outside of the defined educational system influencing its scope and its definition of problems. The arrow indicates a movement through time and space. At the right end of the arrow are two divergent decisions. Planning either leads to a practice which becomes established or to the termination of some practice, either a former one or one which was not effective following deliberate planning.

General statements on PPBS are contained in Program Budgeting... David Novick, Ed., (Santa Monica, California: RAND, 1964, 1965) and Harry J. Hartley, Educational Planning-Programming-Budgeting: A systems Approach (Englewood Cliffs, New Jersey: Prentice-Hall, 1969).

Superimposed on this basic dynamic are three circles labeled planning, programming, and managing. Each represents a major division in the total planning process and resembles somewhat Anthony's division of planning into strategic planning, management planning, and control. Each circle is envisioned as an arrow proceeding in a direction. This is to suggest that each of the operations, represented by a circle, while interdependent, establishes a dynamic within its functional space. On each circle various basic activities for the particular planning process are indicated. Once ideas are developed at the planning level, they can be moved to the programming level. When effective programs have been designed, they can be transferred to the management level and operated as on-going program. Information from operation is fed back to the programming and/or planning stages so as to review the present process and to generate new planning. If the continuation review indicates that the programming (although it may require modification) has been satisfactory, it will remain a management-level responsibility. But if the review indicates that the programming is not constant with the system needs, then additional planning will be undertaken based on experience with the systems operation.

Each of the activities on the circles relates to a particular kind of activity. For instance, an educational system would under-

take a needs analysis, but similar analyses would be undertaken by a health system, a welfare system, and a manpower procurement system. These analyses would indicate trade-offs among the systems. Each activity, therefore, suggests a major integrated planning process. One can imagine a number of circles connecting each activity, almost as gears intermesh.

This kind of planning model should be applicable to all the levels of planning indicated by Figure 4. The model serves two purposes: First it emphasizes that at any planning level the total process of planning can be undertaken in the stages represented by the model; thus, the integrated function of planning is explicated. Second, the model shows some ways of relating these planning levels and indicates how feedback can be used as a basis for future planning. Through this dynamic both the time and the hierarchical dimensions can be related by an integral process.

This generalized planning model offers another advantage. Within its boundaries models developed for curriculum, mathematical analyses or for management may be contained. While no one model can adequately present the dynamics of education, one which facilitates understanding the processes for effective educational planning can be exceedingly useful.

ORGANIZATION OF THE PLANNING PROCESS

The first section of this chapter attempted to establish a definition for long-range comprehensive educational planning, and the second discussed some theoretical bases for this activity. The present section will now attempt to place this function in an organizational setting. The viewpoint will be specifically on long-range, comprehensive educational planning within federal, state and local educational agencies, because regardless of the thrust by industry on the instructional and curricular areas, the public schools will continue to be the baseline institution for such planning.

Location of Planning Responsibilities

There is general agreement in the planning literature that the more comprehensive and the more long-range the planning effort, the higher the responsibility for it should be placed in the organization.¹ Several levels of public planning are usually recognized: (1) planning as a political process, (2) planning at the national priority level, (3) planning as a function of the state education department, and (4) planning in the local school district. Additional planning and development missions are carried out by R&D centers,

¹Preston P. Le Breton and Dale A. Henning. Planning Theory (Englewood Cliffs, New Jersey: Prentice-Hall, 1961), p. 184.

universities, and professional organizations. These efforts, however, are generally not comprehensive in nature.

Buchmiller describes the educational comprehensive planning process as it relates to basic concepts of public administration. In an extremely useful paper, he suggests that:

Ample evidence can be found within the various layers of bureaucracy of public administration that competition for resources will set up at least four levels in the politics of planning. The first level can be characterized as the intra-agency competition for the ear of the executive for various component parts of the program for which the agency is responsible. The second level is the inter-agency competition for priorities and financial resources to carry out programs for which each agency is responsible. The third level of political conflict occurs in the legislative arena as executives seek and compete for political support necessary to establish and implement needed programs. The fourth is between government and the private sector where intense competition shows no sign of abating; rather, it will probably increase as larger allocations of financial resources become available to meet social needs.¹

Buchmiller indicates clearly a basic tension in the planning process between the legislative and the executive function at each level of government. Indeed, a considerable literature discusses the appropriate location of the long-range, comprehensive educational planning function. This discussion can be summarized by recognizing that comprehensive, long-range educational planning is facilitated by the mutual cooperation of political and administrative elements

¹Archie A. Buchmiller, Central Comprehensive Educational Planning: A Role for State Educational Agencies (Madison, Wisconsin: Wisconsin Department of Public Instruction, DPI-BOP-2-1969, 1969) p. 5.

at each government level and among the various government levels.

Within this context McClure indicates that the state education department "should have responsibility for planning on a long-range basis. But this planning cannot be left entirely to the agency itself and its staff members. The state agency is in a unique position to give leadership but it must involve others.¹ Furse suggests several choices for a state's selection of an appropriate planning mechanism:

1. The state education agency may assume responsibility for or may be designated as the sole planning body for all aspects of education....
2. A planning council (or commission) may be created--by legislative or executive action with representation from the major sectors of education....
3. A state planning commission may be elected or created to coordinate statewide educational planning, and to assimilate educational plans into a total, comprehensive state development plan.
4. A citizen's committee may be appointed to establish broad educational goals, and to reconcile the needs of different educational agencies and institutions. Regular authorized administrative bodies could serve the technical planning needs of such a citizen's goal setting committee.
5. The state legislature may retain to itself the right to formulate plans.

¹William P. McLure, "Planning Adjustments in the Educational System," Educational Planning in the United States, op. cit., p. 136.

6. An eclectic or syncretic approach may utilize elements from all of the above as well as additional ones not included here.¹

The role of the federal government in comprehensive, long-range education appears confused and subject to interpretation, since studies of the comprehensive planning process at the federal level have not indicated any specific locations for planning responsibilities.² Several functions of federal planning are significant: (1) federal planning is rarely comprehensive; it results in specific legislative programs to meet specifically defined educational needs. (2) the implementation of PPBS within the Department of Health, Education and Welfare and the U.S. Office of Education led to the establishment of planning departments at the office and bureau levels. These departments have not yet, however, made available long-range plans for their particular divisions, although they have produced much of the groundwork necessary for planning.

¹Bernarr S. Furse and Lyle O. Wright, eds., Comprehensive Planning in State Education Agencies (Salt Lake City: Utah State Board of Education, 1968), pp. 26-27.

²See, for example, Robert Dorfman, ed., Measuring Benefits of Government Investments (Washington, D.C.: Brookings Institution, 1965), and The Planning-Programming-Budgeting System: Progress and Potentials, Hearings before the Subcommittee on Economy in Government (Washington, D.C.: Joint Economic Committee, Congress of the United States, 1967).

(3) there seems to be no particularly viable models guiding the appropriate purposes and tasks of educational planning at the federal level. (4) an effective approach to understanding federal planning is through the study of individual legislative histories. An important aspect of the federal involvement in educational planning has been the support of these activities at the state and local level. Through monies made available under Title V of the Elementary and Secondary Education Act, various projects in comprehensive planning have been undertaken within specific states and by regional or other state groups. These projects represent the comprehensive approach to the design and development of comprehensive planning missions within public agencies.¹

The development of comprehensive, long-range planning in local school districts has been less organized and consequently less significant than the development within the state educational departments. This concern appears directly attributable to three factors: (1) a lack of outside support for such activity, except as it relates to the grants procurement process for federal funds; (2) a lack of commitment on the part of the local electorate and school administration for comprehensive long-range planning;² and (3) a

¹See Furse, op. cit.

²Some school districts indicate important exceptions. Planning missions are underdevelopment in Niskayuna, New York, Garden City, New York, Dallas Texas, among others.

lack of skilled planning personnel available to the local districts.¹

Nevertheless Hill suggests that

A logical approach to long-range educational planning is to consider planning as a basic responsibility of the local school community. If such planning is initiated at the local level, it must rise above local provincial interests and be coordinated with overall community, area, state, and national needs.²

McClure, on the other hand, has distinguished between the appropriate planning functions of the local district, the regional agency (if one exists), and the state education agency and finds these functions central to the local school district: definition of goals, adjustments to the conditions for social interaction of members in the organization, performance of members of the organization, capacity of the school system to use improved technology, and improvement of the social context of the school's system.³

Planning within each of these units is important, but the relations between the units is equally important. Effective, comprehensive, long-range educational planning requires effective

¹The University of Alabama, under a grant from ESEA Title V, is developing a graduate program and training local educational agency planners.

²John C. Hill, "Long-Range Educational Planning," Comparative Education, XXXIV (May 1968) 270.

³McClure, op. cit., p. 129

communication and interaction among the horizontal and vertical units of the total system. Equally important to such educational planning is appropriate communication with the political and social forces outside the field of education or the institution of the schools.

The traditions of public planning and corporate planning have emerged from separate roots and primarily with separate purposes. Public planning has been concerned generally with larger geographic areas and greater segments of the population than corporate planning which has been product oriented, concerned with profit, and with forming the corporation to meet its stated goals. If anything, corporate planning appears to have been somewhat more simplified than public planning because the corporate goal structure seems less complex. These distinctions, however, seem to be lessening as the corporation continues to become more diversified and complex.

Branch has summarized the corporate planning responsibility as follows:

In its planning, corporate management is concerned with the business activity as a whole. This includes a number of diverse elements interrelated within the organization in a complex pattern: people, money, materials, machines and equipment, objectives, policies, procedures, information, knowledge, morale, and many others. A second set of vital interrelationships with the socio-economic, governmental, and physical environment external to the corporate organization itself is also involved. These two sets of

interactions are interdependent, of course, and their differentiation is useful mainly for analytical purposes; an input at any one point will influence various aspects of the enterprise, some directly and immediately, others by a series of repercussive effects. Clearly, an awareness of as many important considerations as possible and their relative significance to the business is necessary for its most successful direction. Certain elements are normally more critical and indicative of the company's state of being and direction of development, but any consideration can become a preeminent concern. Planning starts, therefore, with the representation of the business organism in being. This representation is extrapolated or projected into various future stages in accordance with trends and objectives. It reflects significant events and decisions as they occur.¹

This apparent close relationship between public planning and corporate planning would seem to indicate that relationships and linkages would be fairly easy to identify and develop. In point of fact, this has not been the case. This condition arises for a number of reasons: (1) most of a corporation's planning is considered proprietary and specific information on products or processes becomes carefully guarded by the corporation which produces it. (2) a long history of social and political antagonism towards public planning has created an inertia vitiating against the establishment of these efforts within the public sector. (3) the necessity for government control--and planning has been a necessary of these control mechanisms--has antagonized various aspects of the corporate and industrial world. (4) the effects of

¹Melville C. Branch, Planning: Aspects and Applications (New York: John Wiley, 1966), p. 253

long-range planning have not always been established as worth the effort involved. (5) the purposes and philosophies underlying the long-range planning effort have frequently been different both for various kinds of industry and various governmental purposes.

(6) the role of government is frequently considered to be one of information collector rather than decision maker and/or regulator.

(7) the influence of federal funding on the direction of various industrial development--especially through military and space research--has had a direct effect on lessening the distance between public and corporate planning. (8) the exchange of expert knowledge and developments between industry and government including the increasing frequency for personnel to move among government, industry, and education, has tended to help develop a common ground for planning activity.¹

The Structure of the Long-Range

Educational Planning Unit

This planning unit should be established and dedicated to the task of comprehensive, long-range planning; therefore, the discussion which follows will not necessarily indicate the type of unit

¹ See Factors Affecting Research and Exploratory Development (Cambridge: A.D. Little, April 1965) and Dean Morse and Aaron W. Warner, eds., Technological Innovation and Society (New York: Columbia University Press, 1966).

which might be established for other kinds of planning, such as economic analysis, curriculum, or business management. Furse finds that in the state educational agency this long-range, comprehensive planning unit becomes a technical planning arm for the state planning mechanism and provides leadership and planning assistance services to other educational agencies.¹ Culbertson in a similar vein lists six functions which will be performed by an effective state educational planning agency:

1. Determining through analysis and assessment those educational objectives for a state which should receive highest priority for given time periods;
2. Developing multi-year master plans....
3. Creating various program alternatives designed to achieve high priority objectives, performing cost-benefit analyses of these alternatives, and translating the results into specific proposals;
4. Assessing state programs of financial support in order to determine their adequacy for ensuring investments deeded to achieve educational goals and when necessary developing legislative proposals to correct inadequacies;
5. Examining school district, intermediate, and state department structures in order to determine their adequacy in relation to achieving established educational objectives;
6. Serving as an interpreter of quantitative data on education and of important state and national studies which bear upon and have implications for educational planning.²

¹Furse, op, cit., p. 24.

²Culbertson, op, cit., p. 280.

Brooks indicates that the "function of a planning unit is to coordinate the activities of planners in such a way as to provide for effectiveness and efficiency in arriving at solution information relative to the following problems:

1. To define and to delimit the nature of the problem to be investigated.
2. To secure and maintain cooperation of appropriate groups, organizations, and agencies in the planning process.
3. To coordinate the activities of the individuals engaged in a planning process.
4. To keep the planning process moving.
5. To maintain documentation of activities, supervise or produce the final report relative to the given problem, including the recommendations for action, and delineate specific recommendations for evaluating the procedures to be followed.
6. To coordinate the evaluation procedures to be followed in determining effectiveness of implemented courses of acting.¹

While the following list is not considered exhaustive, the Institute For State Education Agency Planners at Mankato suggests the following outcomes should guide the establishment of the planning unit:

1. A management information system
2. A state plan for vocational education

¹Brooks, op. cit., pp. 16-17

3. A state plan for special education
4. A plan for agency "self-renewal"
5. A PPBS plan
6. A plan for adopting a packaging concept for the allocation of federal and state funds
7. Strategies to meet special problems or for implementing programs
8. Establishment of priorities for agency
9. Establishment of priorities for allocation of resources ¹

When the planning mission was established in the New York State Education Department, the challenge for the Department planners was stated in terms of the following considerations:

(1) how to strengthen the capacity of the entire education system for change; (2) how to stimulate local education systems to become much more responsive to local needs; (3) how to help the state education department provide increased leadership and support for change in education; (4) how to help local, federal, and state authorities coordinate their efforts more effectively in the accomplishment of clearly defined overall goals; and (5) how to help educational

¹Institute for State Education Agency Planners, A Guide to Planning Programs (Mankato, Minnesota: Mankato State College, Planning Guide Series, Guide #1, June 1969), p. 45.

agencies at all levels increase the impact of their efforts so that there is a growing sense that intentions and plans can indeed be translated into tangible, measurable results.

This writer has suggested the following functions for an educational planning agency: (1) the development of long-range comprehensive plans; (2) the development of plans for one, five, ten, and twenty years; (3) the development of models for planning (including the explication of alternative futures and trade-offs based on them); (4) the development of innovation and implementation models, especially for broad-based changes required by new and comprehensive planning; (5) undertaking a training function in the need for and the techniques of comprehensive, long-range planning (both within the SEA and other units concerned with planning--the legislative branch as well as local school districts); (6) the determination of the effects of extra-educational developments on the nature of the education system; (7) the establishment of planning information system (based on the information requirements for achieving the above tasks); (8) the determination of appropriate responsibilities and organizational relationships with an evaluation mission, the control function, and the research "universe" affecting educational development; (9) coordination and interrelation of "area" plans, i.e., financial projections, construction schedules,

curriculum models, etc.; (10) consulting and advisory role to the departments of the state educational agency and to local and intermediate school districts (and other agencies concerned with long-range comprehensive educational planning).

This list summarizes the functions described by the brief literature on educational planning. Note that most comprehensive, long-range educational planning has developed in the state educational agency or within a planning branch of the governor's office. This does not vitiate the responsibility of a local educational agency (or of appropriate regional agencies) for similarly developing comprehensive planning. It simply indicates that at present funds and personnel have gravitated to the state educational agencies. While a large city school system would find its resources permitted the development of a separate planning mission, the average school district would probably not be able to support such a function, even while acknowledging its value.

A comprehensive planning office should procure broad spectrum "generalists" for the senior positions, and this orientation towards planning is more significant than the mixing and matching of particular skills. In fact, personnel training in the various planning skill areas are in extremely short supply and the director of planning missions should anticipate the need for extensive

training of the basic staff. Since skills are in short demand, the planning office may serve as a clearinghouse for extra-agency contracted planning. The assigning of planning tasks to research organizations, educational industries, or capable university structures recommends itself not only as a means for obviating the personnel shortages but also as a means for insuring broad expertise and communication outside the agency. The planning office, however, bears the responsibility of insuring the suitability of these contracts by generating the planning needs. The office must also be responsible for the comprehensiveness of the planning effort, for the usability of the product, and for reporting procedures free from bias. Within this framework, the assigning of planning missions outside the agency can provide a more liberal and more broadly gauged view than would be possible within the agency as the result of even normal organizational constraints. At the same time, however, it must be stressed that "planning itself should not be contracted out. Planning cannot be done to or for an organization; it can only be done by the organization itself."¹

¹Ackoff, op. cit., p. 132.

Organizational Relationships and
Establishment Problems

Based on this investigator's experience assisting the establishment of a planning office within the U.S. Office of Education and through a review of the literature, the following considerations in the establishment of a planning function were considered to deserve attention:

Develop an autonomous mission clearly separate from the decision making process. - This paper finds a clear distinction between the planning process and the control process, and it should be maintained in the establishment of a planning office. Failure to do so may prevent the development of adequate long-range viewpoints and the ability to evolve alternatives to present management procedures.

Protect the planning office from inappropriate activity such as report preparation, "crash assignments," and short-range or narrow gauged studies and position papers. - A planning unit, once established, can be easily victimized by a large organization, especially one operating on a minimum of resources. The director of planning and his staff become useful targets for "crash" projects. To obviate this problem an understanding of the planning mission must be developed on the part of all executives.

Promote and establish appropriate inter- and intra- agency feedback mechanisms. - The best communication channels are probably the informal ones of interest and expertise. The planning director and his staff should make every effort to become familiar with these informal processes within the relating to the organization. Staff linkages from the planning organization to extra-organizational programs should be encouraged. This means that planners will be members of task forces, staff committees, and other informal and task-oriented groups in the organization.

Encourage and support by leadership of the planning staff maximum inter-staff communication, collaboration, and interaction. - This requirement suggests that a primary mission of the planning staff should be the organizational development and human-relations training function. An analysis of staff functions and development should be an on-going process in the planning office, and this function should be related to the larger organization. Again, the largest number of people who can reasonably be involved in the policy design process should be encouraged by the planning office. Procedures for these considerations should be developed early.

Disseminate information to the agency, the departments of the organization, and outside the organization. - Comprehensive, long-range educational planning activities are sometimes not only viewed

as esoteric but as limited to a small number of "in-members." This concern can be obviated by regular briefings both to the chief executive and his staff and to all members of the agency. Bulletins and other information on the activities and achievements of the planning office should be issued regularly. In addition, the planners represent a strong resource for speaking to local associations and others concerned with planning and should be utilized for these purposes.

The Comprehensive Educational Planner's Characteristics and Qualifications

The characteristics and qualifications of the comprehensive educational planner will form a basis for defining the qualifications of the education-industry planning consultant. The literature does not offer great support for the ideas presented in this section, perhaps because the role of comprehensive, long-range educational planner has only recently been defined. The following section, therefore, is, in part, conjecture based on the opinions of selected writers and the writer's experience. In discussing the "ideal systems engineer," Hall specified four primary personal characteristics for this individual:

First comes the faculty of judgement, of sound appraisal with complete objectivity. Second, creativity is so vital a part of the systems engineering process that a vigorous imagination

is essential. Third, a systems engineer must have facility in human relations, not just the neutral ability to "get along" with people, but the positive attributes of leadership, tact, diplomacy and helpful concern so essential in effective teamwork. Fourth, since his conclusions are valueless until convincingly transmitted to others, and since he must act as a broker of information, the systems engineer must have a gift for expression--oral, written, and sometimes graphic.¹

If the comprehensive, long-range planner is seen as a change agent, it would be advisable for the individual to possess this range of knowledge described by Bennis:

1. Conceptual, diagnostic knowledge cutting across the entire sector of the behavioral sciences
2. Theories and methods of organizational change
3. Knowledge of sources of help, and
4. Orientation to the ethical and evaluation functions of the change agent's role.

In a similar vein Jung, writing about the trainer change agent role, indicates that this person should possess three kinds of skills: problem-solving skills, interpersonal skills of relating, and inner-personal learning skill.² Furse has cataloged a number of technologies and specialities which the comprehensive planner should possess within three categories:

¹Hall, op. cit., p. 87.

²Charles C. Jung, "The Trainer Change-Agent Role Within A School System" Change in School Systems, op. cit., pp. 100-101.

- Group I . Training related to organizational/procedural mechanisms
- Group II . General comprehensive planning technology
- Group III. Technologies "keyed" to steps of a problem-solving model.

Furse's analysis represents the most comprehensive statement of skills, including such techniques as operations analysis, management development, contingency planning, brain storming, and simulation. This list does not suggest that one individual should possess those skills; rather that they should be made available to the planning effort.¹

A clear concept of the comprehensive, long-range planner has been provided by Dr. Merlin Duncan, former director of the Mankato Institute for State Agency Planners and now director of the Institute for Local Agency Planners at the University of Alabama. In response to the question, "What should a comprehensive, long-range educational planner look like?" Duncan suggested the following abilities and traits of character:

1. This person should have the ability to fantasize. He must be able to dream about the future and to conceptualize new worlds.
2. The person must have the ability to use his ability to fantasize, (he is not simply a dreamer; he is a creator of new realities from dreams).

¹Lyle O. Wright, Developing Comprehensive Planning Capability in State Education Agencies, Bernarr S. Furse, ed., (Salt Lake City, Utah: Utah State Board of Education, 1969), p.26.

3. The planner must be aggressive in his intellectual relationships. He must be an active thinker, capable of trusting his abilities and broad in his intellectual activities.
4. The planner must have an adequate evaluation of his own ability to produce. He must be aware of his strengths and limitations, but he must see his production of plans as viable mechanisms for change and growth.
5. The planner must be politically oriented and understand social systems and subsystems which he hopes to plan for.
6. The planner must recognize the distinction between external and internal planning. In other words, he must be able to establish the parimeters of his planning mission and the limits of his organization.
7. The planner must have the ability to understand his role as a planner in an organization and not to overstretch the boundaries of his planning role so as to confuse this role with the decision-making authority which must rely on his influence.
8. The comrehensive, long-range educational planner must be a generalist, comfortable in moving among many fields of knowledge and organizations.
9. This planner must have the ability to look at himself and his organization in a realistic way.
10. The planner must be super conscious of his personal relationships within his own organization and the linkages from his organization to others.
11. He must understand that his plan is based on the informal organization before it can then be translated to the formal organization.
12. The planner should be knowledgeable in finance and the interrelations between the budget and the program.
13. The planner requires a knowledge of history and the ability to see his organization in terms of his milieu.

14. The planner's approach to planning must account for his philosophies and that of the decision-maker's in the organization. There must be a consonance between plans and basic philosophies within this society and those held by the planner.
15. The planner must be acutely aware of the needs and personalities of his colleagues, his superiors, and others to be affected by a plan. From this awareness, he can create plans in which everyone wins.¹

The comprehensive, long-range educational planner appears effectively defined as a generalist, an individual who can operate comfortably at the philosophical level, while maintaining an action orientation, and who has derived his training and experience from a number of disciplines. The development of such individuals within the field of education has been difficult. Indeed, Branch states that "no educational program exists at the present time that emphasizes comprehensive planning as a field of study. The first and only effort in this direction was the program of Education and Research in Planning at the University of Chicago."² He points out, however, that education in functional planning is usually a part of the parent field of study. Curle traces various programs related to the development of educational planners and finds these relevant:

¹ Recorded during a conversation between Merlin G. Duncan and the author, February 25, 1970.

² Branch, op. cit., p. 274.

preparation for economic planning, technical preparation in both educational and human resource development planning, university programs in comparative education and allied subjects, and some university programs in subjects outside the field of education.¹

The design of programs for comprehensive long-range educational planners has been undertaken at Mankato and at the University of Alabama. Mankato brings together people from state educational agencies for programs of training and problem solving. It is designed to assist experienced professionals in the rapid development of skills in this field. The program at the University of Alabama resembles a graduate degree program, and results in the award of the Ph.D. At Alabama the prospective local educational agency planners receive training in five basic training areas: physical environment planning, area analysis, government administration, regional economics, and educational planning (including human resources, cost planning, quality educational planning, and planning educational objectives).²

¹Adam Curle, Problems of Professional Identity: An Examination of Training for Human Resource Development and Educational Planning, Occasional Paper #6, (New York: Education and World Affairs, July 1968), pp 33-42.

²Paul Orr, "Local Program Planners: Their Preparation and Function," paper for the Institute for State Educational Planners, Mankato State College, Mankato, Minnesota, October 17-25, 1968.

Although industry does not provide any substantive programs for training educational planners, such organizations as the American Management Association are beginning to develop short-term programs for training administrators in educational planning skills. While there is a general exchange of personnel from industry to educational executive positions, and presumably this results in the transfer of some planning skills, the field of comprehensive planning has not yet been effectively enough developed so that a common program exists. Industry does, however, provide systems analysts, computer technology resources, systems engineers, marketing and financial specialists, and other management specialists for the planning process. These are important contributions, but, like the school system, industry is searching for comprehensive, long-range educational planners.

IMPLICATIONS FROM THIS ANALYSIS OF PLANNING

This brief analysis of the long-range comprehensive educational planning process provides a framework for developing the expertise of the education-industry planning consultant. As will be indicated, the consultant role generates directly from the need for assistance in these kinds of planning activities. Interactions with education and industry will evolve through the processes discussed in this

chapter. The implications from this analysis can be organized in relation to two major ideas:

The Focus of Planning

Hoos, in her analysis of the California systems studies, concludes that system design engineering will require great modification and refinement before it becomes useful for public problem-solving.¹ This statement, in part, summarizes the "state-of-the-art" in planning. So far, planning has concentrated on components and subsystems, rather than on the exceedingly difficult task of conceptualizing the total system. Effective, comprehensive, long-range planning must begin with an operational view of society, followed by a definition of education, and then followed by an understanding of the institutional setting in which education functions. Educational planning must come to grips with an uncertain future. Howsam feels that the "major pitfall facing the present (or any) generation of planners is its built-in tendency to view the future in frames of reference suited to an already outmoded present and past." He finds the following 'planning pitfalls' which must be avoided:

¹Ida R. Hoos, "A Critique on the Application of Systems Analysis to Social Problem," (Berkeley: University of California Space Sciences Laboratory, Social Sciences Project. Mimeographed, May, 1967) p. 14.

1. Planning for a world that no longer exists
2. Assuming that a problem is the same as one encountered in the past, but merely bigger
3. The solution to a problem merely requires a larger "dose" of remedies previously utilized
4. Excessive reliance on a single approach to the solution of a problem
5. Letting others determine what changes should be made in education
6. Failure to recognize to take into account, changes taking place in the role of education ¹

Planning Needs at the Present Time

The greatest need for planning at this time appears to be the development of improved theory. Planning must be conceptualized as a comprehensive, long-range process in such a manner that linkages between education and other areas of society can be developed. The material in this chapter has suggested one qualitative methodology for arriving at such a theory. The problems of evolving such a theory remain exceedingly complex. Most planning efforts, especially in the field of education, have sought to proceed and to develop

¹Robert B. Howsman, "Problems, Procedures and Priorities in Designing Education for the Future," Cooperative Planning for Education in 1980, Edgar J. Morphet, ed., (Denver: Designing Education for the Future: An Eight State Project, January 1968) pp. 83-93.

quantitative and objective paradigms either based on extant philosophies or totally ignoring the necessity for philosophical clarification. Schlesinger expresses this difficulty:

Analysis cannot bridge the gap between irreconcilable objectives. At its best, analysis can shed some light on the costs of accepting one objectives at the expense of others. But there is a danger that analysis may help to disguise fundamental choice problems as efficiency problems. Analytical techniques have been most successful in obtaining efficient operation through the compromising of several objectives. But some objectives are not susceptible to compromise, and such objectives could easily be ignored in the simply-minded quest for efficient solutions.¹

Lest it be assumed that these problems are simply ones of omission, the perspective offered by Weinberg seems worthwhile:

The technologist is always appalled by the difficulties faced by the social engineer: To an engineer even a small social change by inducing individuals to behave differently is always harder even when the change is rather neutral or beneficial...By contrast technological engineering is simple; the rocket, the reactor, and the desalination plants are expensive to develop, to be sure, but their feasibility is relatively easy to assess, and their success relatively easy to achieve once one understands the scientific principles that underly them.²

Weinberg's solution to this complexity is the concept of the "technological fix" applied to social problems. This kind of fix "accepts man's intrinsic shortcomings and circumvents them or capitalizes on them for socially useful purposes. The fix is therefore

¹Alvin M. Weinberg, "Can Technology Replace Social Engineering?" Atomic Scientists, December 1966, p. 44.

²ibid.

eminently practical and in the short-term relatively effective." The difficulty with the technological fix, however, is precisely that it offers a technological rationalization for the cut-and-fit methodology or "add-on" processes of educational planning and change which seem to continue ineffective. If the problems of education are to be ameliorated over the long haul, it will be necessary that comprehensive, long-range planning missions be developed.

CHAPTER IV

THE EDUCATION INDUSTRY PLANNING CONSULTANT

INTRODUCTION

Chapters II and III attempted to show that problems among industrial and educational organizations result from a lack of commonality in conceptualizing and applying long-range, comprehensive planning. There is a growing recognition, however, that elements of education and industry will require more effective means of interaction than previously, if broad-based technological educational systems are to be effectively designed. Industry, as it makes a direct thrust on the curriculum and instructional areas on education, must interact effectively with school designers and administrators, who, in turn, must be aware of the limits imposed by the structure of the schools. One possible way of achieving effective linkages among education and industry is provided by the education-industry planning consultant. This chapter will attempt to define this role and its potential for contributing to the solution of these planning problems.

SOURCES OF THE ROLE

The study of technological innovations in education, and other broad-scale educational change, makes clear that "total system planning" has seldom been considered. This condition became exceedingly evident to this investigator as a result of participating in an earlier study.¹ There appeared to be a need for an independent consultant who could facilitate the problems in communication arising from the basic difference in the organization of education and that of industry. As Simon suggests:

Organizations are formed with the intention and design of accomplishing goals; and the people who work in organizations believe, at least part of the time, that they are striving toward the same goals. We must not lose sight of the fact that however organizations may depart from the traditional description,...nevertheless, most behavior in organizations is intended rational behavior.²

One potential solution for insuring the effective planning of industry and education is the development of a common ground

¹W.P. Kent, W.A. Le Baron, and R.M. Peterson. Feasibility of Using an Experimental Laboratory for Identifying Classroom Multi-Media Problems and Requirements (Falls Church, Virginia: System Development Corp., Final Report, U.S. Office of Education Contract: OEC 1-7-071143-4491, June 1968).

²Herbert A. Simon. Research Frontiers in Politics and Government (Washington, D.C.,: 1955), p. 30, quoted by Chris Argyris, "The Individual and the Organization; Some Problems of Mutual Adjustment," Administrative Science Quarterly, II (June 1957) 7.

which will facilitate the free exchange of ideas and techniques between the partners for educational change. Industries which are concerned with the design and production of parts, components, or systems of education would communicate through the vehicle of this common ground with the operators of the public school systems.

A consultant of this nature represents only one alternative to the problems of education-industry relationships. He represents a third party who may perform important functions in the planning and development process. This background provoked the development of the consultant role.

Education-Industry Use of Consultants

Various prototypes of the consultant role have assisted the development of the education-industry planning consultant. Industry has had a long tradition of using outside consultants. The public schools, however, appear to have limited their use of consultants in the areas of curriculum and instruction, but there seems to be an increasing acceptance for their services. Certain kinds of industrial consultants have found wide acceptance among school people. Especially popular have been those persons who after a product was sold have taught teachers how to use the product, but this type of consulting relates to the sales process. The planning consultant represents a new role which draws on these earlier activities.

Consultants may be grouped into several major categories which suggest their knowledge and purpose. These following groups established for the purpose of this investigation, are not mutually exclusive; rather, they indicate how and why education and industry have used consultants although under different conditions:¹

Outside Experts. - Outside experts are used to fill gaps in the organization's knowledge base. They either represent a limited or highly specialized resource, or their skills are required less than full time by the organization. Among outside experts frequently used by education include systems analysts, computer programmers, specialists in educational finance and cost accounting, lawyers, psychiatrists, and design specialists. These skills are not only in short demand, but these specialists are usually unwilling to be employed full time by a school district or to settle in locations away from central cities.

Management Consultants. - This term defines a general category which includes a consultant in any area relating to the development or improvement of the management processes and functions. He may apply a special expertise or he may be a generalist concerned with analyzing problems. The primary use of management consultants

¹This description was developed in conversation with John Harris, Senior Social Scientist, System Development Corporation and Joe Bangiolo, Senior Systems Analyst, System Development Corporation.

rests on the "outside observer" (or third person) relationship with the organization. Sometimes, the organization employs persons possessing the skills of the management consultant, but the consultant can remain detached from the immediate operation. Management consultants frequently assist in the development of improved management and operation, but they do not usually relate directly to the design or implementation of new curriculum processes.

Change Agents. - A new form of management consultant, the change agent, is concerned with organizational development and relies heavily on behavioral sciences, human relations, and intergroup communications skills. These consultants are concerned with changing organizational purposes, structures, and means of communications to meet new requirements for effectiveness and efficiency arising from forces outside (as well as inside) the organization. While the management consultant concerns himself with the improvement of some function within the organization, the change agent seeks to improve the organization's overall design. He is concerned with the structure of the organization which will best promote appropriate behavior in people. Over the past 20 years the application of the change agent approach to industrial problems has been fairly well accepted. Their use in school districts is finding increasingly popularity, although the nature and development of the role remains

well accepted. Their use in school districts is finding increasing popularity, although the nature and development of the role remains somewhat controversial.¹

Legitimizers. - The legitimizer, because of his personal position, knowledge, reputation, or "connections," can provide necessary political support for the establishment of new ideas or processes. This support is frequently required when funds must be sought from foundations or government agencies for either the development of a new product or installation in the public schools. Legitimizers are used to review projects, to assist with their design, and to provide the necessary "superstructure" relationships with the social, professional, and economic power structures. Many legitimizers do not perform a consultant function: They serve only through an interest in a project and lend the prestige of their position to it. Other legitimizers find that the time commitment which they must make to a project and their desire to adequately review and critique it prior to lending their support require that they function in a consultant capacity.

¹Edgar H. Schein, and Warren G. Bennis. Personal and Organizational Change Through Group Methods: The Laboratory Approach (New York: John Wiley, 1966).

Outside Evaluators. - Outside evaluators may include the auditing and operational aspects of the organization, as represented by the CPA. Evaluators use information developed by the operation as a basis for judgement following the operation. Some formats are predesigned to meet legal and fiscal regulations, but program evaluation is sometimes based on the personal skills and insights of the outside evaluation consultant. If a program of evaluation has been effectively designed at the outset, the work of the outside evaluator functions in support of the internal evaluation efforts by adding a third person review and by relating specific programs to others resembling it. If these conditions accrue, the use of an outside evaluator can be significant.

Another form of consultant use was mentioned by a respondent to the education-industry planning consultant model developed in this chapter. He suggested that consultants frequently serve to provide a temporary arm of a staff function within the institution. This situation occurs because the staff has more work to do than it can handle. Consequently, consultants form a "work pool," a sophisticated management "Kelley Girl Service." It is important to emphasize that in one sense these individuals are not functioning in the consultant role because they are functioning in the same manner as regular employees.

Weber and Blumberg, in their study, "Educational and Industrial Consultants: A Comparison," derive the following differences between the anticipations of educators and industrial people for the use of consultants:

1. Those who employed educational consultants put greater emphasis on academic credentials (expecting consultants to have a doctorate) than did those who employed industrial consultants (expecting the consultant to have only a bachelor's degree).
2. Those who employed educational consultants put greater emphasis on age (expecting a consultant to be about 50) than those who employed industrial consultant (expecting a consultant to be about 35).
3. Those who employed educational consultants put greater emphasis on experience in educational fields (expecting the consultant to have at least 20 years experience) than did those who employed industrial consultants (expecting the consultant to have at least 5 years experience in industry).
4. Those who employed educational consultants expected the consultants to consult on long-term basis in which they would help the organization to deal with problem areas; whereas those who employed industrial consultants expected a consultant to come in, solve a problem, and get out.
5. Those who employed educational consultants expected to pay consultants less (\$75-\$100 per day) than did those who employed industrial consultants (\$100-\$200 per day) (present rates for educational consultants would be \$100-\$300 per day and for industrial \$150-\$450 per day).¹

¹Wilford A. Weber and Arthur Blumberg, "Educational and Industrial Consultants: A Comparison," unpublished manuscript (Philadelphia: Temple University, 1966), as reported in a letter from Weber to the writer.

Studies of this type are extremely scarce, but it is helpful for developing a consultant role acceptable to both the industry and the education group. Indeed it is this aspect of the consultant model which will be hardest to design and yet most critical for successful implementation.

Development of The Role Model

Since the literature in the field provides very little help, developing a role model for the education-industry planning consultant becomes the primary task. The role stems basically from these considerations:

1. The education industry planning consultant represents a common ground between industry and education; therefore, he must be able to communicate effectively with both education and industry.
2. This consultant functions to apply the techniques of education planning as derived from the broad literature explored in Chapter III to major problems affecting curriculum and instruction.
3. The individual who performs this consultant role will probably be a generalist whose primary skills rests in the areas of problem analysis, design, systems analysis and human relations.
4. The nature of the consultant's activities will require his placement outside the formal structure of the operating school district and outside the product oriented (product design and producing sections).

Based on the problem universe outlined in Chapter II and the planning methodologies derived in Chapter III, the role model was designed in terms of the following categories:

1. The consultant's role and functions
2. Educational qualification and experience
3. Organizational and contractual relationship
4. Inhibitors to effective consultant relationships

This investigator, through his work on the study referenced by note 1, participated in a series of discussions which led to his developing the idea for the education-industry planning consultant. Over a period of time these ideas evolved into their present organization. The design of a model seems reasonable, because the related fields of industry-education relationships and educational planning appear to lack adequate theoretical understandings. A first need is the development of a strong basis for prediction and of models for such action. This condition recommends the use of techniques which encourage the design and testing of models.

A NOTE ON METHODOLOGY

Techniques for the design and testing of unsure futures have been reported by Olaf Helmer in Social Technology.¹ His approach

¹Olaf Helmer, Social Technology (New York: Basic Books, 1966).

called the "Delphi Technique," functions to apply some control to the use of expert opinion and case study forms of social research, so as to make possible the development of useful predictions on subjective questions. The technique is applicable to questions of prediction about future events or methods of meeting future needs (as the education-industry planning consultant is predicted to meet certain needs in a developing relationship).

Helmer reports various applications of the technique on an experimental basis, and others have found it useful for predicting future trends. For the purpose of this study, the following conditions concerning application of the technique are applicable:

1. Helmer's research indicates that a carefully selected panel of 15-20 experts will achieve as effective a consensus as a larger group. (Consensus means agreement and movement towards the mean).
2. The method, however, requires that the experts report and consider individually. They may receive feedback from other respondents, but they do not debate or discuss the material.
3. The use of a predesigned model--as in the case of the prospectus for the education-industry consultant role--may be employed to save time and to codify earlier work before submitting it to a jury of experts. In this event, "it is of the utmost importance to assure each respondent of the desirability of any modifications of the model that he regards as imperative, lest the entire effort be devoted to 'the wrong problem.'"¹

¹ibid., p. 15.

The methodology can be summarized as follows:

The Delphi Technique eliminates the need for committee activity altogether, thus further reducing the influence of certain psychological factors, such as specious persuasion, the unwillingness to abandon publicly expressed opinions, and the bandwagon-effect of majority opinion. This technique replaces direct debate by a carefully designed program of sequential individual interrogations interspersed with information and opinion feedback derived by computer consensus from the earlier parts of the program.... An inquiry into the reasons and subsequent feedback of the reasons adduced by others may serve to stimulate the experts into taking into due account considerations they may through inadvertence have neglected, and to give due weight to factors they were inclined to dismiss as unimportant on first thought.¹

Specific Steps in This Study

The procedures used in this study follow, in general, the outline of the Delphi methodology developed by Helmer. Since the study deals with a broadly conceived model, convergence towards the mean will not be considered as the major finding; rather, a consensus, predicting, by general agreement (or disagreement) with the model's value, a viable alternative for dealing with specified problems, is sought. Respondents are presented with the model of the education-industry planning consultant in a fixed interview situation. During the interview, various aspects of the model are emphasized (e.g., the model specifies a generalist; there may be special problems in establishing him). For the most part, however, the

¹Olaf Helmer and Nicholas Rescher, "On the Epistemology of the Inexact Sciences," Management Science, 6 (1959) 48.

respondent reads the prospectus and reacts to those aspects he finds significant.

The respondents are requested to provide two kinds of feedback:

1. Any comments on the model--directly to the investigator or later in the form of margin notes, cassette recordings, or otherwise--which will indicate agreement, disagreement, modification, or needed change in any aspect of the model's design, subjective values, or purposes.
2. A short letter to the investigator indicating a general position on the model.

In this respect the feedback implicit in the Delphi technique can be achieved. Each respondent reacts during the interview, but he also has time for reflection and later comments. The results of these interviews and the comments submitted by the respondents will be reported in summary form as they relate to each aspect of the model. Major modifications and changes in the model will be included in the summary and recommendations. The letters received from the respondents will be attached as an appendix.

Selection of the Respondents

The criteria for the selection of respondents included a concern that they represent a broad geographic area including Washington, D.C., the eastern coast, and the midwest of the United States. Of the 16 respondents, four were unknown to the investigator

prior to the study, and he had met three others only on one occasion. Except for a brief resume presented at the interview, these individuals were unaware of the author's experience or concern for this field.

Selection of the experts must be such as to insure a broad perspective on the problem and a broad spectrum of experience and viewpoints. Generally, the experts should not be interlocked with each other prior to the probe; that is, the use of predeveloped consensus should be avoided. In the case of the present study, the following criteria were used to select the members of the panel:

- a. Each has had experience in both education and industry.
- b. Each has had experience as a consultant.
- c. Each is a "generalist" within his range of interests and can be identified with positions and activities which indicate this orientation.
- d. Each presently holds a position of authority and prestige within his organization which permits a broad range of exposure and opinion.
- e. Each stands to gain something if the consultant role can be effectively (operationally) defined; that is, each recognizes the importance of improving methodology and finding new ways to challenge the area of problems.
- f. Each respondent is familiar with, and to a great extent, contributes to, the emerging technological processes forcing change and development within the public schools.

- g. Each respondent, while a generalist personally, can make a unique (or special) contribution because of a profile different from the other members of the panel.

All potential respondents were contacted by telephone and were informed of the methodological approach being employed and its presumed reasonableness. They were also asked to be available for at least a one hour personal interview with the investigator. Each respondent was also offered the opportunity to respond in a manner comfortable to his style; by marginal notes, by dictating in a cassette, or through extended discussions with the author. Without exception, individuals asked to function as respondents expressed great willingness to do so. In one instance, a potential respondent from industry discovered that his schedule would not permit extensive confrontation, although he agreed to meet with the investigator briefly and to submit comments later at his convenience. This interest seems to verify the strong feelings both in education and industry that a more adequate means of communication among the forces affecting educational change be devised, and it may have indicated some predisposition to find the consultant role an effective way of developing this area.

Only one respondent chose to comment without first reading the role perspective, apparently feeling that familiarity with the investigator's preliminary efforts were unnecessary. Some of this

respondent's comments were valuable, but their basis as a reality screen for the purpose intended is, of course, limited. Most respondents spent longer time and greater energy analyzing the preliminary model and suggesting modifications than had been expected. One interview lasted over five hours and did not result in a complete reading of the document. This readiness to respond emphasizes the awareness among the respondents improvements in these areas.

The following persons served as respondents:

Dr. Frank Anderson, Director, Education Projects
Encyclopedia Britannica Educational Corporation
425 North Michigan Avenue, Chicago, Illinois 60611
(Former Administrative Assistant to the Superintendent
of Public Instruction, Colorado; Director, Colorado
Small Schools Project)

Dr. Franklin Barry, Director, Research and Development Center
American Management Association, Hamilton, New York
(Formerly, Superintendent, Syracuse, New York, Public Schools)

Dr. Roger Barton, Associate Superintendent for Planning and
Research, Dallas, Texas, Independent School District
(Former Assistant Superintendent for Planning, Texas State
Education Department; Assistant Superintendent, Curriculum,
Corpus Christi; Director, Southwest Regional Educational
Laboratory)

Perry Crawford, Senior Systems Planner, Advanced Systems
Design Laboratory, IBM, Yorktown Heights, New York (Former
president, present member, Croton-on-Hudson School Board;
Director, Regional Education Center, Westchester County)

William Dudenhausen, Executive Vice-President, Laidlaw
Brothers, Publishers, River Forest Illinois 60305 (Former
teacher and principal, educational salesman and consultant)

Dr. Merlin Duncan, Professor, University of Alabama,
Director, LEA Planners Project (Former Vice-President
Mankato State College and Director, Institute for State
Agency Planners, Mankato)

James A. Fellows, Associate Executive Secretary,
National Association of Educational Broadcasters
1346 Connecticut Avenue, Washington, D.C. 20036
(Manager for planning, staffing, etc., of the Samoan Project)

Miss Julia Hamblet, Special Assistant to the Commissioner
of Education, Assistant Director, Right to Read Program,
U.S. Office of Education, Washington, D.C., (Formerly,
Director, Women's Marine Corps and Director of Training for
the Corps)

Dr. Jack Kleinmann, Director of Planning, National
Education Association, 1206 Sixteenth Street N.W.
Washington, D.C. 20036, (Former Director of Special Projects,
Assistant Director of Research, NEA)

Dr. Robert La Penna, Assistant Superintendent, Washington, D.C.,
Public Schools (Formerly, Pennsylvania School Administrator;
Chairman, Citizens Committee Task Force on the Passow
Report, Washington, D.C.).

Bertram Mogan, Director of Planning, U.S. Office of
Education, Washington, D.C. (Former Assistant for Planning,
Department of Defense)

Joseph H. Oakey, Director for Research and Planning
Niskayuna Public Schools, Schenectady, New York 13212
(Consultant for Planning, American Management Association,
Planning Consultant for the State of Colorado; Formerly
Engineer and Industry Manager)

Dr. Harry Phillips, Director, Division of State Agency
Cooperation, U.S. Office of Education, Washington, D.C. 20202

Dr. Mark Scurrah, Assistant Director, Center for Planning
and Innovation, New York State Education Department, Albany,
New York (Professor of Educational Philosophy, Ithica College)

Dr. Wendell Shackelford, President, Guidance Associates
(a Subsidiary of Harcourt, Brace) 22 Washington Avenue,
Pleasantville, New York (Formerly, teacher; formerly
director, Systems and Technology Division, Harcourt-Brace)

Dr. Wilford Weber, Assistant Professor, Syracuse University
Director, Center for Research on Teaching, Syracuse
University (Consultant to Teachers Corps, various school
districts)

DESCRIPTION OF THE MODEL AND REPORTS
OF THE ORIGINAL TESTING

The prospectus for the education-industry planning consultant functioned to brief respondents on the substance of Chapters II and III; and it contained the nucleus for defining the role. Each respondent commented on the prospectus and offered general remarks concerning characteristics, problems, or conceptual needs. This feedback can be effectively reported by presenting the original statement, including additional rationale and justification, and then indicating the significant aspects of the discussions concerning that point.

Definition of a Consultant

In order to clarify the difference between a consultant and other organizational relationships, a definition was posited as a general framework for analyzing the special role of the education-industry consultant and his function. The consultant was defined as:

A consultant is any non-permanent employee of an organization hired to fulfill certain kinds of predefined tasks requiring special expertise or role relationships which cannot effectively be provided by a regular (including temporary employee functioning as regular) member of the organization.

The intent of this definition was to focus on the non-permanent nature of the relationship and its dependence on either special expertise or role relationships. The definition was criticized by five respondents, although one found it excellent. First, a consultant is generally not hired to perform a specific predefined task; an important aspect of his relationship is to help the organization define that task. He clearly must approach any problem as defined by the organization only as a basis for initiating the relationship, and he must retain the freedom to redefine the problem and the tasks related to it. These comments suggested adding the words: "or redefine certain ill-defined tasks." Second, an organization will choose to bring on a consultant based on the services required from him. This meant to the five respondents that the ability of the consultant to redefine the task (or to conceptualize the problem) required initial definition prior to accepting the task. Unless the consultant has the freedom to redefine his function, he will be limited to the client's statement of the problem which may be a detriment to his effective operation. Third, the consultant was

seen by one respondent as a kind of resource rather than as an employee. The objection here is that the consultant functions in a manner unlike that of an employee because his aims and goals are different from those of the organization. Fourth, it was suggested that the organization, when it approaches a consultant, recognizes a need which it is unable to adequately describe, and for which it is unable to name appropriate tasks to resolve. With these modifications--especially the necessity for the consultant to contribute to the definition of the problem--this statement emerged as adequate for the purpose of this paper.

Definition of The Education

Industry Planning Consultant

The education-industry planning consultant was defined as follows:

The education-industry planning consultant helps organizations establish and maintain effective working relationships among the partners in the educational development process through the application of comprehensive, long-range planning processes and the performance of facilitation, linkage, and brokerage roles.

The consultant sees his major obligation as to the problem and to the improvement of education. His interest is vested neither in the perpetuation of the school system nor in the advancement of a given set of products. His pay-off is an effective working relationship between the participants.

The major problem with this definition was caused by the use of the term, "comprehensive, long-range planning processes." How long is long-range planning? This became a significant question at various points during discussions with the respondents. The emphasis here was on a role which would use planning techniques as a basic methodology. Long-range planning, therefore, may encompass a brief time period or a very long one, depending upon the requirements of the planning mission. One respondent from industry commented, however, that industry is not really interested in effective working relationships unless effective means fairly quick and truly dramatic sales." He pointed out that there are exceptions; for example, Project PLAN has effectively organized the resources of industry, education, and research organizations for the development of a computer-based instructional management system. No profit from Project PLAN is expected prior to 1972, permitting a development period of approximately five years.

The working relationship among the education-industry partners should include both educational research and development as an appropriate continuum. The consultant then might join a project at the research stage but would stay until such time as it had been effectively implemented. The role should be a continuing one, and the consultant's usefulness increases as he develops new linkages and understanding with the various partners in the planning process.

For one respondent, the emphasis on the consultant role should be on this function as the neutral party in the educational development process.

The education-industry planning consultant is not so interested in his tools and techniques as he is in the problems he is asked to deal with. He selects and applies various aspects of the long-range planning process as they assist the development of communication. The consultant must be flexible not only in terms of techniques but also in terms of his ability to relate to the various partners of the education-industry relationship, who would perceive him differently because of their background and interests.

Relation To Other Consulting Roles

The education-industry planning consultant shares the characteristics of the consultant roles described earlier:

The Outside Expert: Since the skills for long-range comprehensive planning especially in the field of education, are in short supply, the consultant can function as an outside expert who might be employed either by a school system or industry. Caution should be exercised to insure that his use as an expert is consistent with his function as the provider of a "common ground" between the organizations of education and industry. He might, however, effectively pursue this major task by contributing the special

expertise of planning within a management structure which perceives planning as the method for improving organizational relationships.

A Management Consultant: Since the consultant works at and with the highest levels of management, and since he must have access to information about all aspects of the organization's purposes, operations, and structures, the education-industry planning consultant functions in ways similar to the management consultant. He is not, however, concerned primarily with the improvement of a single management function or with providing special insight on management on operational problems.

The Change Agent: All planning implies change; consequently, a planning consultant must be sensitive to his critical role as a change agent. For these purposes the educational-industry planning consultant will rely heavily on the field of organizational development. He will frequently find himself performing communications, group development, and organizational analysis tasks resembling those of the change agent. In this particular instance, the consultant is concerned with the interrelationship among organizations as well as within a single structure. His function will, as a result, require additional sensitivities.

The Legitim�izer: The education-industry planning consultant will be required to exercise great caution in using the techniques

of the legitimizer. Indeed, the primary difficulty with the establishment of the role may well be the feeling that the planning consultant is simply functioning as an aid to the industrial organization's sales motive. To counteract this concern, the education-industry planning consultant must assure that he operates primarily through the use of his special expertise, to develop (in conjunction with the organization) planning models and programs to assist management in the planning process. Indeed, the role of the legitimizer seems inappropriate for the education-industry planning consultant.

The Outside Evaluator: The consultant, as part of effective planning, might preplan the evaluation effort in conjunction with members of the organization. He might participate in the judgement process to suggest changes in plans based on feedback from operation. Two respondents suggest that the relationship between the outside evaluator and the consultant required modification, they were concerned about the consultant's ability to exercise insights from "outside" the project's scope since the value of the outside evaluator is found through a vision unclouded by day-to-day operations. He provides insight based on other experiences outside the value structure of the operating organization.

The Need for The Consultant

The need for the education-industry planning consultant arises from changes in the nature of industry-education relationships as traced in Chapter I and from the new requirements imposed by technological developments and systematic and logical planning. Harris suggests four reasons to use a consultant:

1. Facts for decision making may not be available locally.
2. Facts may be available, but interpretive experience is lacking.
3. Experience from other places can be used locally.
4. Agreement cannot be reached on an effective alternative.¹

One respondent pointed out an important advantage of the education-industry planning consultant. He has a broad number of contacts and expertise which results from his involvement with many different assignments, and his mobility provides for a higher quality planning service than might be available through local management. This special expertise would be the primary motivation for a board of education or industrial management team to seek outside assistance. One respondent expressed concern that looking for outside assistance not be interpreted as a vote of mistrust in the present administration. This seems unlikely if management exercises reasonable propriety.

¹Norman C. Harris, "On Being a Consultant," Junior College Journal, 37 (April 1967) 9-13.

Special roles performed by the education-industry planning consultant would include those of broker and linker. The consultant could effectively contact, organize, and relate a number of production organizations and educational organizations around a single problem area. The problem might be evolved by a school system, a consortium of school districts, or a major industry which was desirous of becoming involved in more realistic educational planning. In performing the brokerage and linkage functions, the consultant might play a kind of "clearing house" activity, but the information basic to this activity would be collected by other agencies. The Educational Products Information Exchange (EPIE) provides a prototype of this clearing house agency function. The education-industry planning consultant would rely heavily on these services, because he would not have the time or the organization necessary to develop these support functions. (A complete consulting service organization however, would include both).

As an outside consultant, loyalty to the problem can override concern for maintenance of either the profit (or other industrial) or the institution (or other educational organization) aim. This particular point was emphasized by one respondent, because his experience has indicated clearly that a concern for product or for school system--frequently concern for self--could "get in the way"

of effectively discussing problems. As he indicated, most educators or industrialists are perfectly willing to discuss any problem except their own, but an outside consultant could talk about the problem without being emotionally involved in it. In this respect, he brings out not only third person rationale, but basic detachment to the discussion.

The education-industry planning consultant role has been generated by an analysis of present omissions and needs in the area of these relationships. Many forms of expertise are available to both educational organizations and to industries concerned with servicing the educational organization, but information on these agencies is not always available. In another respect, the regional and the local response would vary according to the qualities of the regular staff and their perceptions of problems in this area. One respondent cautioned that the primary difficulty with establishing the education-industry planning consultant would be that local agencies most needing help would be those least able to recognize their need for assistance. This concern led to generating the contact and role establishment processes to be discussed later in this paper.

Functions of the Consultant

The primary motivation for the education-industry planning consultant was the perceived need for services related to the

planning for components and systems of educational technology. This overriding principal underlay the development of a system of functions for the consultant.

The Role. - The role must be defined broadly enough so that the consultant can function as a generalist while specializing in the area of planning. A simple listing of functions may not adequately describe the consultant's activities. For this reason, two different approaches were undertaken. First, a list of functions which the consultant either performs, or assists the organization to perform, was developed to describe the parameters of the role. The following functions were included:

1. The consultant provides a neutral context for problem analysis.
2. The consultant develops bridges for communications.
3. He supports discussions by making critical processes entries.
4. He assesses the impact of the decision processes used by the organizations.
5. He helps all parties recognize and deal with constraints.
6. He initiates discussions of mutual obligations and expectations in order to arrive at a smooth working relationship.
7. He helps discover appropriate resources and services and links these to the client agencies.

8. He helps develop feedback and evaluation procedures
9. He suggests necessary considerations outside of the immediate decision area and predicts potential trouble spots.
10. He recommends alternative ways for viewing the situation restating the problem, or redefining the problem universe.

An eleventh function originally included in this list was stated as follows: "The consultant related industrial and military training developments to the general education market." This function was felt by all except two respondents to be outside of the role of the consultant. Two respondents indicated that this function would require a different kind of consultant because of the information required by the task, although the activity might be listed as a secondary or associated function. One respondent, in attempting to conceptualize the consultant's role, suggested that he functions to determine points of common agreement among parties and establishes these as points of entry. He also functions to establish long-range points of conflict and helps develop current programs that will either eliminate or ameliorate the differences as the partnership begins to approach them. To another respondent, the consultant's most important function is "to ask the right question in the right way." The ability to perform this function sets in motion a process which forces people to think about the decision they must make. This respondent felt that a consultant would have

to do all of the things included in the basic analysis of functions. He was joined by five other respondents who questioned, in one form or another, how it would be possible for any consultant to perform all these functions; this concern led to generating a second list of functions which indicates the kinds of activities a consultant may find himself involved in:

1. The education-planning consultant analyzes management problems related to decisions about technological implementations and to the continuing operation of the new system.
2. He provides outside expert analysis of plans developed by school districts, industries, or other planning mechanisms.
3. The consultant reviews and evaluates research proposals, evaluation contracts, and other grant procedures employed by school systems and industries.
4. He designs solutions to delineated educational problems.
5. The consultant determines the reasonableness of conclusions in terms of good working relationships and viable programs.
6. The consultant advises educational industries on their planning and development to meet the school market.
7. He reports on the success and problems of industry-education planning activities.

All respondents emphasized the importance of industry-education planning activities and the consultant's role in reporting successes and problems relating to effective planning and product development. Great concern was expressed about statement number 6

and use of the expression "to meet the school market." It was felt unanimously, by the respondents that the consultant would advise the educational-industry on planning and development, but the direct relation of the consultant to any aspect of the marketing process was found objectionable by all the respondents except one. A distinction should be clearly made between the consulting activity prior to product development and marketing and those activities which accompany sales. Both of these activities are reasonable, and each is important to the success of a venture. The consultant, as envisioned by the prospectus, would confront great role confusion if he functioned close to the market processes.

Another aspect of this marketing problem might be mentioned. One industrial respondent urged strongly that "there is no school market." Each school district procures for itself the instructional products which it requires. This may include text books, mediated devices, or any form of instructional equipment. In this respect a textbook publisher is not in direct competition with the manufacturer of auto-instructional devices, because both would be parts of an effective instructional program. This concern prompted another respondent to wonder about products industry ought to produce, not simply for sale (i.e., to meet known needs) but to meet needs based on judgement criteria other than marketing. In

other words, is the market responsive only to the felt needs of educators or is deliberate planning being undertaken to assure products which fit a changing and developing system? This area appears an important crux in the effective establishment of the education-industry planning consultant.

Secondary Functions. - For the consultant role to be effective by providing clients with a broad-based menu of services related to planning, certain related activities must be provided for. These secondary functions appear to fall within the parameters of the education-industry planning consultant role, but they should not be construed as central to the definition of the role. This consideration is important, for these secondary functions, in and of themselves, could become full time activities for other consultants. The education-industry planning consultant would undertake these activities only as they related to the primary functions. Included in this group are the following:

1. The consultant maintains information files and liaison with state and federal government agencies.
2. The consultant is familiar with requirements for proposal preparation and with appropriate government funding sources.
3. The consultant maintains a reference and resource file on training and education programs in the broad area of planning.

4. The consultant can perform a general program review within a local school district.
5. The consultant may advise on the establishment of planning missions for education and the operation of selected training activities required to help establish these missions.
6. The consultant may design a staff development program within the area of planning, organizational development, and communication skills.

The list originally included the following secondary functions:

"the consultant may advise on the potential implications of proposed ventures." This concern was removed because of its relation to marketing as discussed earlier. As a result of his experience, the consultant may become aware of important new areas for development. He may discuss this information with clients or otherwise, but he will not act as an advisor on the establishment of ventures. Another secondary function, mentioned by one respondent, requires the consultant to work in the area of mental health. This respondent felt that frequently good staffs are so confused and upset by new planning concepts that someone has to challenge them to recognize their abilities for planning.

The areas of proposal preparation and governmental liaison were seen as extremely important by several respondents. One respondent indicated that a vast number of school districts and many industries simply do not know how to communicate with the

federal government for funding. Another respondent felt that these areas would take on greater importance with less sophisticated clients, and the education-industry planning consultant, unless careful, would see his time consumed by this requirement. Since becoming and staying informed on the intricacies of proposal preparation and government contracting requires considerable effort, the consultant would either require assistance in this area or would effect a liaison with firms which specialize in writing proposals and procuring federal funding. Related to this was the suggestion that the education-industry planning consultant might want to provide an information service to clients on a more or less regular basis. The idea of a newsletter or a similar vehicle suggested itself as a means of staying in touch with clients and prospective clients. This suggestion broadens the nature of the consultant's organizational arrangement and indicates the need for special services.

Limitations on the functions. - Since the education-industry planning consultant emphasizes long-range, comprehensive planning, various activities which the consultant may be asked to perform could be detrimental to the successful implementation of his role. The role emphasizes developing effective interaction among elements of education and industry. These interactions will

be inhibited if the consultant is seen as co-opted by either the industry or the school district for its own purpose. For this reason limits on the role must be established. The following functions appear inappropriate for the consultant:

1. The approval of individual plans, products, educational packages, or other educational products which do not result from a planning process involving the consultant. (i.e., product endorsement).
2. Advice and procedures for implementing a prepackaged learning on hardware system (or solution derived from another situation), especially when no alternatives have been designed. (i.e., product marketing).
3. Any planning mission (or contract) which fails to apply a comprehensive, long-range planning orientation to the design of solutions.
4. An attempt to use planning as a justification for inadequate programs (based on insufficient resource allocations, or other reasons).

Reactions of the respondents to these role limitations was enthusiastic. The functions of product endorsement and product market were clearly seen as outside the consultant's functions. One respondent suggested, that the education-industry planning consultant might find himself being asked to develop a long-range plan for a specific product or technological system believed useful for education. The consultant might then undertake a planning process which would determine the relationship between the product

and the school and point out changes which might be required in both. This kind of product planning appears feasible within the limitations placed by the role, but it would certainly not be a primary function. The difficulty with undertaking activities in this area becomes one of insuring that the consultant is not contaminated by these activities. The success of the consultant role will depend on the individual performing the role so that potential clients are convinced that the consultant is neither wedded to a single technology nor co-opted by the school district. To assure that this condition does not develop, the consultant must exercise careful judgement in selecting problems to which he will relate and functions which he will undertake in relation to those problems.

THE CONSULTANT'S QUALIFICATIONS:

EDUCATION AND EXPERIENCE

The qualifications for the educator-industry planning consultant, both his educational background and experiences in other areas should be directly related to the requirements of the role and its functions. This concern suggests that the consultant will require considerable experience in both the areas of industry and

education, especially a background in management and planning. In order to explicate these qualifications in general terms, five statements were presented to the respondents, as follows:

1. The consultant understands the traditions and the broad spectrum of the schools and is basically an educator.

Twelve respondents felt strongly that the consultant should be basically an educator, because, as one indicated, "the whole damn wood-work is full of medicine men!" Two respondents suggested that the consultant should not be basically an educator, but an individual who was able to relate to educators. This implied that teachers, school administrators, or other school district occupations were not a necessary form of experience. One respondent was concerned that without a background of educational experience, the consultant would find it difficult to achieve credibility in the educational sphere. This issue, of course, would be resolved only when the role is tested and the background of individuals is evaluated. The Weber and Blumberg study indicates that educators place a great emphasis on the credentials of prospective employees. For this reason it may be necessary that the consultant have had some educational experience.

2. The consultant can communicate with industries and is familiar with the new terminologies being developed.
3. The consultant possess insight about the communications process, behavioral sciences, human relations, and his role in effective interactions.

One respondent modified this statement to suggest that the consultant not only posses insight, but also capability in these areas. It was his concern that while many persons possess insight, only a few, through special development and training are able to function capably. One respondent felt that this was the most important area of qualification for the consultant and

that his ability to function as an effective human relations agent would determine his success. This concern provoked another respondent to emphasize the necessity for knowledge of social science concepts in approaching the problems of the consultant. These ideas were summarized by another respondent who felt that the consultant should be familiar with the techniques of planning and should be able to apply them to problems of education in terms of the capability of the staff with which he is asked to work.

4. The consultant is familiar with the techniques of educational planning and the problems of translating industrial experience to education.

This statement caused difficulty for two respondents. One felt it carried the implications that "somehow it had all been done before," and the major issue was simply spreading effective practices. Another respondent noted that the phrase assumed a positive value in the direction of this translation which he felt might be subject to question. This respondent inquired also about other areas of experience which might be applied to education, among them, new learning from health sciences, agriculture practices, etc. This comment again raises the problem of defining a sufficiently broad scope for the consultant without unwittingly dissipating his energies through failure to suggest effective limitations.

5. The consultant is sensitive to the management constraints and requirements of the school system and of the educational production industries.

While many respondents emphasized the importance of this statement, one suggested that a consultant should be sensitive, but not too sensitive, to constraints and requirements. The value of the role is the consultant's ability to see clearly that limitations on operating systems can be modified through effective planning. These general requirements appeared satisfactory to the respondents. No major statement was added, and none of these statements was violently objected to.

Education. - A program of education for the consultant would reflect a broad pattern of general and special studies. As was indicated in Chapter 3, only two programs now exist for the education of planners. Based on these programs, and other background in Chapters II and III, the following areas of education are considered important:

1. General education; including philosophy, humanities, and science.
2. Management and organization studies (behavioral sciences).
3. Special long-range comprehensive planning techniques.
4. Human relations, intergroup communications, and organizational development skills.
5. System analysis, operations research, or other specific planning processes.
6. Curriculum planning models, educational media planning and educational research and design.
7. Information processing systems, evaluation and analysis design.
8. Economics and political sciences with an emphasis on governmental planning for education (and institutional interrelationships).
9. Writing and other communications skills.

The intent of this "menu" of educational needs is to provide a broad, general education consistent with the concept of the education-industry planning consultant as a generalist. One respondent felt the list should be placed in rank order. He placed

area number 4 in first position and considered numbers 3 and 7 as second in importance. The respondent felt that the program of education for the consultant might first develop a person able to communicate and then one highly skilled in planning techniques. Another respondent did not see an understanding of industry evolving through this list of educational needs. He urged that the consultant must understand the psychology of profit-motivated people rather than just all the problems of education. Two respondents hoped that a next step would be the development of a training program for the consultant, one suggesting that the program be developed in detail through the last two years of undergraduate work and the first two years of graduate study. Another respondent, however, emphasized strongly that formal education was not enough. The education-industry planning consultant would require a particular set of competencies, regardless of how these might be learned. This respondent (from a university) was urging that experiences outside of the formal curriculum were an important part of the education required by the consultant.

Experience. - The education-industry planning consultant should be familiar with the differences in the functions of educational organizational and industrial ones. To achieve this, he should have gained experience through the following kinds of activities:

1. Teaching (public schools and/or other).
2. Other assignments within the public school organization.
3. Research and planning experiences, within a school district, another educational agency, or industry.
4. General planning activities for a variety of organizations.
5. Industrial or organizational experiences related to production.
6. Management experience, preferable in both industrial and educational organizations.
7. Specialized use of knowledge in major disciplines.
8. Consulting experiences with schools, educational organizations, and industry.

Again, one respondent felt the list should be organized according to priorities. He suggested that numbers 5 and 6 were most important, in that order. Another respondent felt that the list required greater development in the area of industrial experience, finding that it presently leans towards educational activities. A third respondent felt that despite any experience that a person might have, his primary usefulness as a consultant would be his ability to discuss a subject well with people who required information and feedback on their planning. In this respect "a track record" in the consulting business would be the most effective experience for the educational-industry planning consultant, and for this respondent any other experiences were considerably less important.

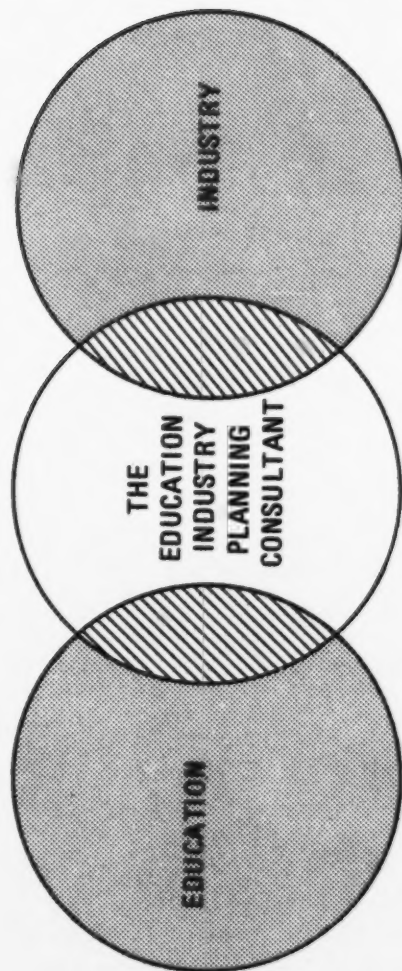
In summary, the education-industry planning consultant would require broad education and experience. Clearly, this education and experience cannot be measured simply through items listed on a resume. The effective value of the experience, coupled with the interpretations derived from it, will determine the effectiveness of the preparation for these consulting activities.

ORGANIZATIONAL AND CONTRACTURAL RELATIONSHIPS

The consultant maintains an integrity of function distinct from the production/market process and from the formal school organization. For this reason, he should be placed outside of the structure of industry and education, perhaps functioning as an independent consultant or employed by a consulting firm. Respondents suggested that the consultant might be employed by a foundation, a college or university, or perhaps a regional educational laboratory. These organizations, however, appear co-opted to certain educational orientations and seem less desirable locations for the consultant than an independent agency. This area will require further analysis.

The original prospectus presented a diagram which tried to show role and contract relationships between the consultant and industry and/or education clients. The diagram failed to communicate

FIGURE 9
THE CONSULTANT COMMON GROUND
BETWEEN EDUCATION AND INDUSTRY



its intent for the respondents. It has therefore been eliminated from this report and replaced by Figure 9, suggested by one respondent: the overlap of each circle of the school and industries circle with the consultant role states that his function derives from each of these areas and, in turn, relates closely to the activities of both areas. The space distinct from either organization indicates that the consultant derives his special uniqueness from additional sources. Note that the school and industry are integrated only through the consultant role; their circles are neither contiguous nor overlapping. This basic diagram expresses the intention of the education-industry planning consultant relationship. It is a bridge between two institutions based on the application of special expertise.

Potential Clients

The education-industry consultant might be engaged by the following potential clients:

1. Industries involved in developing and marketing products relating to instruction and administration of the schools.
2. Legal school districts acting as program operators, planners, or in any way responsible for curriculum and instruction (but fiscally independent or free to enter into a contract).
3. Other school organizations concerned with curriculum and instruction (including private and parochial schools).

4. Corporations operating as the primary agent for the planning, development, implementation, and operation of components or systems which affect the curriculum and instruction of the public (or other) schools.
5. Government agencies (federal, state, local and regional) concerned with long-range, comprehensive educational planning.

One respondent was disturbed by the reference to marketing products in statement number 1 and another urged that the consultant not be interpreted as looking for business or new markets. It seems advisable to rephrase this comment as follows: industries involved in developing and planning educational products related to instruction and administration of the schools. This restatement appears to keep the flavor of industry's potential involvement with the consultant, but avoids the marketing aspect. Insuring that these relationships are maintained at that level will, of course, depend on the integrity of the consultant. Another respondent suggested that the education-industry planning consultant might be most effectively used by consortia of school districts who were initiating joint planning procedures for the implementation of broad-based educational technologies. Indeed, the consultant could function most effectively with such a group whether it was organized independently or operating under the aegis of a regional laboratory. Another respondent was concerned that perhaps the description

provided so far was simply that of an educator who becomes a consultant, and who then, because of special compentancies, makes himself available to industry. This argument contains some validity, but the present educator would only rarely have received the broad-based training and experience in planning which would prepare him for this role.

The method of engaging the consultant would vary according to the purpose and the organization undertaking the engagement. Kintzer and Chase suggest five steps in the process: These are as follows:

1. The client would identify three or four consulting firms which might be useful in dealing with his problem.
2. The client would set forth in writing what he wants. (this statement may not permit adequate room for the problem analysis and identification function required of the planning consultant).
3. The firms representatives would be invited for a proposal discussion.
4. Each consultant or consulting firm would prepare a formal proposal including the following information: A statement of specific work, personnel qualification and staff, fees (fixed or maximum), estimated completion time (and presumably target dates for important events during the contract), billing information, expenses, number and type of reports and specific references from former employers.

5. The client would appoint a regular liason to work with the consultant during his tenure.¹

These five steps adequately define the basic process for involving the consultant. The industry-education planning consultant may, through his own efforts, initiate consulting activities with various organizations. These activities would arise from mutual recognition and discussion of needed services and might be based on the following motivations:

Sensing a communication problem

Facing conflict within its own interdisciplinary team.

Needing feedback prior to public exposure.

Building entry and interaction models for working with the schools.

Presenting information to educational decision makers.

Testing its own assumptions about educators and their schools.

All respondents reacted negatively to three proposed sources of involvement between industry and consultant. These were:

"finding its sales approach ineffective; developing the dimensions of a new education package; and looking for the handle on a new

¹Frederick C. Kintzer and Stanley M. Chase, "Consultants as Change Agents," *Junior College Journal*, 39 (April, 1969) p. 54.

market." The intention of these statements was not that the consultant should assist the marketing activity; rather, if sales approaches were ineffective, the product might not satisfy the requirements of the schools and a planning process would be signaled. These statements clearly did not convey that meaning and are, therefore, best omitted.

In a similar sense a school management team might involve the consulting team:

Sensing a communication problem.

Distrusting the nature and validity of the information at its disposal.

Recognizing the need for an effective communications context.

Accepting the need for analyzing the broad implications outside the immediate context.

Requiring a disinterested appraisal of its planning.

Needing effective alternatives to the plan submitted by one industry.

Finding itself deficient of adequate planning skills.

Developing implementation models and acceptance procedures for changes in the system.

Testing its own assumptions about industry and its potential influence on the schools.

Industry and education working together, may involve the consultant:

Finding their interactions non-productive.

Sharing dissatisfaction with a planning arrangement.

Sensing a lack of mutual understanding and trust.

Facing criticism from an uninformed third force.

Requiring mutual guidance on appropriate feedback and evaluation procedures acceptable to both parties.

Recognizing an educational situation to which both can contribute but needing a model.

Developing planning procedures and ground rules prior to contractual arrangements.

One respondent suggested that a community involvement, perhaps by a Chamber of Commerce committee, might find an outside resource such as the consultant useful as they determined whether or not to support school policies. Employment by such a group appears perfectly within the dimensions of the consulting role. Another respondent emphasized that the point of entry should be carefully investigated because it may be crucial for success whether the consultant was initially sponsored by industry or education.

Another question concerned the method by which the consultant might make it known that his services were available. Essentially, how would the consultant get across the idea that he could be useful to the partners in an educational planning process? This respondent felt sure that his school district, mutually planning with a major

industry, had effected a strong relationship, but their planning would have been greatly facilitated by the use of a "non-sensitive consultant."

The question of advertising the consultant to potential clients was not considered in the initial prospectus for the role, but it deserves careful attention. Major educational consultants advertise in educational and technology trade journals. The consultant, through his activities with educational organizations (writings, speaking, and consulting) becomes known to the educational leadership. The consultant must assure that his publicity does not indicate that he is particularly desirous of serving one element of the joint planning process.

Contract Relationships

Critical to the success of the education-industry planning consultant's role will be the nature of the contract relationship developed between him and the client. Since the role envisions an integrating function, some contract relationships may be developed (and then funded) by the partners to a planning mission. This type of contract would be ideal, but it suggests great difficulties for the partners to the relationship.

The AASA Commission on Administrative Technology expressed this concern about the use of consultants:

Caution should be exercised in the selection of a consultant firm; this firm should have a real understanding of the educational enterprise and be sensitive to the unique problems of the school system. The strategy may begin with the feasibility study. Here consulting help from a university (and few do this) or from private consulting agencies (only a few have staff competent to work in educational organizations) would be most usable...the feasibility study could reveal: (1) the nature of planning necessary (2) components of the organizations in which certain operational techniques could most readily be applied. (3) the extent of readiness and capability to the staff and the organization to implement the approach. (4) the inservice training necessary for existing staff. (5) the kind of additional staff needed. (6) the kind of results in terms of efficiency if a system were implemented (7) the cost to the school district.¹

While these cautions seem reasonable, they appear to fix emphasis on the negative aspects of the consulting relationship. Generally a consultant (including and especially the education-industry planning consultant) would investigate the desirability of establishing a relationship. This initial contact would probably be at no cost to the organization. It might be followed by a one or two day visit to the organization on a per diem and expenses basis. This would provide the consultant and the organization a chance to meet

¹AASA Commission on Administrative Technology. Administrative Technology and the School Executive, Stephen J. Knezevich, ed., (Washington, D.C.: American Association of School Administrators, 1969) pp 112-113.

each other and to share perceptions of the problems and the potential from the consultant relationship. Only then would the consultant decide to undertake a long-range relationship with an organization. (He might also decide through the process that he could not effectively serve this organization). From the organization's point of view, this method would provide an effective look at the consultant prior to a long-range obligation and would prevent a large expenditure before adequate working relationships had been established. Within this framework, the consultant might function under the following types of contract relationships:

General Retainer. - By an industry or a school district (or other) for purposes of consulting on questions of long-range, comprehensive planning. Under such a retainer the consultant would:

Help evolve long-range plans and alternative statements of problems.

Indications and strategies related to the selection of various alternatives.

Would not market a single product or set of products.

Study the past uses of technologies to discover more effective means of planning future uses.

Develop planning attitudes and skills (through inservice training, etc.) within the client's organization.

Perform organizational development (and related activities) within the structure of planning and implementing new educational programs.

Specific Retainer. - For any of the above activities or in relation to a particular situation. Such retainers should:

Involve the consultant at the outset.

Provide for a continuing relationship through planning, implementation, and operation.

Relate the consultant as a resource, not as a compensation for inadequate management.

Review and analysis contract would be limited to the critique of efforts in the area of planning or implementation. This activity would not involve a long-range relationship with the organization, although it might provide an effective opportunity for the consultant and the organization to confront each other. Assuming an effective review, the organization and consultant might want to explore a continuing relationship.

Site visit, review and evaluation contracts for a limited duration and for a specific end product would be appropriate as they relate to the development of the planning processes. The education-industry planning consultant would avoid too great an involvement in these activities. They are valuable for exposing the consultant to new situations and operations, but they can detract from long-range intensive involvements.

Training activities would include formal workshop and staff development programs which the consultant might either design or operate. Since his expertise is limited to the operation and estab-

lishment of planning processes in relation to program change, his contributions in these areas should be similarly limited.

METHODS AND OPERATIONS

This section provides a brief introduction to the function of the education-industry planning consultant as he undertakes the task of establishing himself with an organization. As one respondent pointed out, the focus is on getting the consultant into the organization and keeping him there on a productive basis. Every consultant contact is different, and the effective consultant will vary his approach according to the needs of the situation. The consultant will choose among the following activities in developing and continuing his relationship with an organization:

1. The education-industry planning consultant will establish an initial contact with an organization and undertake preliminary activities to:

Establish existence of a problem.

Suggest suitability of his services.

Determine initial procedures for dealing with the situation.

Set limits on his role as a consultant.

Terminate with a request for his involvement in an extensive problem analysis and action model.

2. Following this initial contact the planning consultant and the organization may determine that the problem analysis and a proposal for services are in order. This would be determined as a result of the consultant's need to:

Survey the situation.

Contact all relevant individuals.

Suggest models of present procedures.

Isolate present blockage points and indicate probable reasons.

Pin-point information needs.

Analyze decision-making processes and recommend alternations or changes.

Determine alternative problem statements.

Relate the problem area to the total management (or decision) system.

Provide a nucleus for negative feedback and frustration.

Decide the suitability of continuing the relationship.

Indicate the parameters of the problem, potential methods of solution, and necessary services.

Recommend sources of additional expertise.

Report, in appropriate format, on the findings and conclusions, suggests implications, and makes recommendations.

Terminate with a model for action.

3. The planning consultant would confront the problem and develop a process of interaction with the organization through the development of the following activities:

Develop a project proposal for resolution of the problem.

Aid in the implementation of the solution.

Insure continuing follow-up services.

One respondent questioned as follows, "does the consultant suggest contracts in terms of goals, objectives, or does this work itself out?" Actually the goals should be established mutually with the organization, and this establishment should include various checkpoints during the procedure. As yet the concept of performance contracting has not been widely applied to the work of a consultant, but it seems clear that in the near future, performance contracting for planning consultants will become fairly routine. The organization will establish checkpoints and criterion for measuring the consultant's performance and determine the desirability for continuing a relationship. Since long-range planning suggests a continuing relationship, both the consultant and the client should feel some satisfaction with the undertaking, or they should be free to reconsider the relationship at any time.

Inhibitors to Effective Consultant Relationships

Since this paper has taken a somewhat ideal approach to the implementation of the education-industry planning consultant, it seemed advisable to indicate some potential inhibitors of the effective

establishment of such a role. The consultant would require awareness of these blocks, and the client would presumably want to examine his responsibility for assuring the effectiveness of the consultant's use. The following inhibitors appear worthy of the consultant's and the organization's attention:

1. The consultant is perceived as a threat (either by the management or the group) who will assist unwanted change.

2. The consultant is perceived as a "salesman."

3. Management does not see the need or the relevance for comprehensive, long-range planning.

4. The group is "closed" to an outsider:

By its nature (sociology).

By role definition (acculturation).

Through prior experience.

5. The consultant is perceived as "in the pay of" one party to a joint planning venture.

6. The consultant himself:

By his attitude or lack of perception.

By his selection of entry strategies.

By personal traits unacceptable to the target group.

7. A member of the organization who thinks he can do the job as well (but who does not perceive the special role relationship).

8. Management fails to establish any entry mechanism or to continue support.
9. The consultant's pay rates seem excessive (probably because of unfamiliarity with this type of service).
10. The result (pay-off or end-product) of the consultant's role is not understood.
11. His temporary relationships is perceived as "irresponsible" to the on-going results of his efforts.
12. He is undermined by factionalism resulting from organizational struggles, or he sides with a fraction rather than concentrating on the planning process and building support for it.
13. The consultant finds that the organization's staff cannot support the changes implied by his efforts through lack of skill, training, or ability.
14. The consultant finds that the organization cannot make available necessary information (or won't divulge information).
15. The consultant selects assignments:
 - Outside or beyond his expertise.
 - Contradictory to his role and damaging to his reputation.
 - Without knowing the situation or predicting the problems which may arise.
 - Without adequate "charter."
 - Too comprehensive for the time or cost structure.

All respondents expressed pleasure with the contents of this list. They particularly chose to emphasize the actual or presumed conflict of interest or the feeling that the consultant

would be contaminated by his relationship to a product or a single organization. Some question was raised about the consultant's concern that an organization could not support change through its lack of skill, training, or ability. Some of the respondents felt that while this may in fact be true, the consultant would be only indirectly concerned with this condition. The consultant would suggest forward-looking programs which management could establish within the organization. One other concern was expressed by a respondent in these terms: "the consultant may be asked to help people who are completely inept!" In this case, the consultant will find his relationship totally ineffectual. This respondent, having operated in situations of this nature, cautioned that the best role for the consultant is to leave the consulting relationship when this condition becomes evident.

This review of the major elements of the consultant role as presented in the prospectus and as criticized by the respondents provides a basis from which some conclusions concerning the viability of the role may be drawn. In general, there was acceptance for the role as it was presented, although the respondent felt free to criticize individual wordings, statements of functions or role, or sections of the text. Several substitute changes were suggested; most notably, it was felt necessary to insure that the consultant's relationship with industry is distinct from the marketing process.

Each respondent evidenced a general concern for the development of a common ground. Curiously, educators felt that industry would be less interested in the common ground, and industry representatives thought that educators would find it less effective. The group of respondents did not add major new categories to those mentioned in the prospectus.

Concerns Arising from the Inquiry

Some general concerns were expressed by the respondents which relate to the definition and establishment of the education-industry planning role. A major observation may be pertinent before this discussion. Representatives of education tended to view industry more positively than representatives of industry; similarly, representatives of industry tended to view education more positively than the educators. There were exceptions, but rather than emphasize a definition of their own positions, the respondents attempted to conjecture about the attitudes of the opposite group. The reaction appeared one clear indication of the need for the industry-education planning consultant, but it was not general enough to establish a distinct pattern. It did not appear to detract from each spokesman's ability to represent himself and his group.

The problem provided a question, "are educators so concerned with the education-industry relationship as industry?" The question was asked by an educator who assumed that industry has a greater

stake in these problems than did education. This remark was prompted in part by the present use of consultants in industry. Most producers of educational materials and systems hire consultants who after the sale of such materials instruct teachers and other users in the operation. The respondent thought industry would utilize the consultants faster than the schools because of their need for communicating effectively with the schools.

Several constraints with the development of role require acknowledgement, but they are not well understood by education and industry. As one respondent indicated, "teacher training is as far as five to ten years behind the methodology available from industry," and this affects the ability of industry to assist the development of new educational methodologies. Again, financial constraints are faced by both industry and education. Industries are becoming more knowledgeable about the political processes because they require the support of development activities in the field of education. This increasing sophistication on the part of the education industry has developed because this group of industries must compete with others for federal funds.

One respondent pointed out the difficulty in industrial relationships in this manner: "The representatives of industry respond to what they see as educational problems, but they have not yet identified the real problems." He suggested strongly that

industry has not yet learned how to spell curriculum. The industry assumes that it is educators responsibility to use whatever is produced effectively. These reactions of the respondents appear to reflect the classic view of education-industry relations, in which education plans its needs and industry fulfills them by providing component parts for the system. Educators maintain a somewhat defensive reaction towards the role of industry, but they accept full responsibility for implementing educational programs. A related observation is that of an industry representative who cautions against the belief of educators that industry does not make curriculum decisions. Such a feeling is completely absurd! Industry must meet mass markets, and, to do so, it must tailor its products to the great majority.

Two respondents wondered how these needs were being met without the education-industry planning consultant, but the literature does not indicate that this function is presently well recognized. Various independent projects indicate that effective education-industry relationships exists, but theory underlying the development of these relationships has not been explicated.

Three respondents questioned the possibility of education and industry developing a common ground. As one respondent

speculated, "what will allow the marriage which will not end in divorce?" Will industry be interested in this role other than as a sales facilitator? One respondent attempted to explicate the important differences in education and industry by suggesting that industry is a much more "lawful" enterprise than education. Industry is entirely devoted to the profit motive; it is unwilling to delay the profit or to expend energies which cannot be directly related to profits. Education, on the other hand, is somewhat more independent in its ability to develop alternative solutions to persistent problems. Another respondent suggested in a similar vein that education, having evolved through its past experiences with industry a feeling of distrust, would be equally opposed to a common ground particularly if the consultant could be interpreted as co-opted by a specific product. The discussion suggests that the consultant will need to be a strong willed, independent person capable of judging the dangers inherent in any potential consultant situation.

Another respondent indicated that the common ground might be difficult to develop because the sociology and acculturation of industrial roles varies considerable from that of educational roles. He suggested such matters as dress and grooming might be different enough to inhibit the free communication of the consultant with educators and industry representatives. Peculiarities

of language and vocabulary in each area may offer stumbling blocks. Can an individual effectively cross the acculturation boundaries of education and industry and be accepted by both groups? It seems from the enthusiasm generated by the education-industry planning consultant that developing such an individual should be possible.

Personal Qualifications

The personal qualifications of the education-industry planning consultant were of special concern to the respondents. Respondents were concerned that the consultant be an ethical human being. Establishing a common ground seemed to require a strong person. For instance, one respondent questioned "how do you keep a consultant from being a tool for industry when the consultant is personally sold on a product?" If the consultant genuinely believes in a particular position to the exclusion of other positions prior to entering a planned relationship, he cannot act freely in that relationship. Associated with this concern was the fear of "contamination by associating," even when the consultant was not so "sold" on a product. This problem resolved itself through emphasizing the personal integrity of the consultant. If he felt he could not operate freely within a situation, he would have to refuse to participate. The individual consultant who is willing to carefully

pick and choose his problems, according to his freedom to act in the situation, will soon gain a personal and professional reputation for avoiding these pitfalls.

One respondent cautioned that the consultant should not be interpreted as merely "selling a bag of planning tricks." The consultant operates within definite fixed limitations, based on his experience, his knowledge, and the dictates of the role. His personal magnetism may permit him to get business, but skill will carry him through these efforts. It does remain a critical question as phrased by one respondent, "when does a politician become a statesman?" For this respondent the consultant appeared to be an educator of great stature. Because this respondent feels that the schools of education do not necessarily produce - in fact, to him they prevent the production of great educators, this respondent was concerned that the background for this kind of consultant could not be discovered. The consultant, as he practices his trade and establishes himself, is best described as a fairly normal, probably rather intellectual, human being who performs one set of fairly straight forward functions in nevertheless difficult situations. It would appear that his area of operation would require statesmanship and that many individuals, regardless of specific background or education will be able to perform these functions.

Two respondents were concerned with a program of accountability for the consultant, and they wondered how this might be done. One respondent is presently using a planning consultant and has developed a performance contract which stipulates certain end products at certain times during the course of the project. If the consultant does not perform adequately, he will not be rehired for the second phase of the project. Since the initial phase is only six weeks, there was no thought of termination prior to the end, although performance is evaluated at approximately 10 day intervals. The performance of the education-industry planning consultant can be tested in two ways: (1) better planning resulting from the consultants efforts as measured by the responses by educational and industrial partners to the situation; (2) better education resulting from the efforts of the planning situation, especially as measured by the learning attitudes, and responses of the youngsters. The questions of establishing accountability will vary according to the length and involvement of the consultant. Long-range contracts should clearly specify fixed end-products. This will be useful for both the consultant and the manager. Frequent interactions between the consultant and client will help maintain a common understanding of activities. In the event that a consultant

develops a reputation for operating otherwise, he will find clients "hard to come by" and perhaps be excluded from the field.

CONCLUSION

The enthusiasm with which all persons asked to respond greeted this activity deserves reiteration. Educators and industrial representatives alike have expressed interest and encouragement in the project and a concern that the area be developed. The education-industry planning consultant's acceptance by industry and education will be based in part on the quality of the individual performing the role. The nature of broad-based technological implementations for education appears to require this kind of assistance, and education and industry alike are becoming increasingly aware of this need.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

This investigation developed an education-industry planning consultant role to function as a common ground between the education and industry partners in the educational planning and development process. The consultant will use the techniques of long-range, comprehensive planning as adapted to the special needs of planning for curriculum and instruction. Based on the study and the reactions of the respondent, the following major conclusions may be stated:

1. Fourteen of the sixteen respondents endorsed the general concept of the education-industry planning consultant as one potential method for ameliorating the difficult problems confronting the joint planning of education and industry. One felt that the role would be extremely useful if the assumptions underlying its development were correct, but he questioned some of these assumptions. One respondent did not feel that a consultant role could offer any new value in this area.
2. Both educators and industrial representatives said they would employ the consultant for some or all of the functions described by the prospectus, but both groups favored the independence of the consultant from both the production-oriented industries and the schools.
3. Great care will be required to establish the credibility of the education-industry planning consultant and to insure his dedication to the problems of educational

planning, especially since a wide-spread tradition of mutual distrust appears to have developed from the recent history of education-industry interaction.

4. The education-industry consultant will perform a "generalist" function; i.e., he is not a specialist in any specific planning technique (or engaged for that reason). His expertise includes problem analysis and conceptualization, interaction analysis and human relations, and the design and development of planning missions. These skills require a broad background of education and experience, reflecting an understanding of both educational and industrial practices.

The major problem with the establishment of the role will be the education-industry planning consultant's need to effectively "bridge" the different acculturation and socialization patterns of educators and industrialists. Indeed, these differences--in dress, mannerisms, and values--appear to be strong inhibitors to the success of the role. This area, while critical, did not appear to vitiate against the role. The consultant will require careful adjustment of his personal and professional actions if he is to succeed in relating to both groups.

Guidelines for the Application of the Findings

As a result of this investigation, some general characteristics and limitations for an education-industry planning consultant have been suggested. In its present theoretical form, the role has appeared worthwhile to a number of respondents. These findings, therefore, may be useful as guidelines for engaging the consultant

to assist the planning and development of curriculum and instructional programs and components. Individuals performing the role, or some of the functions assigned to the role, may provide additional operational evidence concerning its usefulness and/or necessary changes.

One respondent has suggested that the role as presently conceived be tested through a U.S. Office of Education planning (or research) grant. He envisions a school district, or consortium of districts, developing active linkages with a number of educational industries for joint planning. The education-industry planning consultant would function as the common ground among these organizations. He would also be responsible for the development of the major aspects of the comprehensive long-range planning. This type of trial situation seems appropriate at this time. The theoretical development of the role model and its reality-testing has presumably contributed to the need for theory in this area and should provide a strong basis from which to design operational testing.

An important next step might be the development of education and training programs for educational planners specifically prepared to function in this role. These programs could be designed by universities, by industries, or through the cooperation of many

groups. Since there is a critical need for planning skills, the design of degree-granting programs might be supplemented by workshops, seminars, and other formats. Again, these developments might be supported by federal or foundation planning grants, but industry might fund the planning of these kinds of programs an effective way to initiate new forms of interactions among universities, school districts, and procedures.

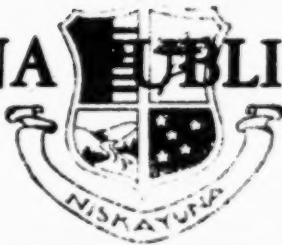
The education-industry planning consultant emerges as one effective approach for improving the processes of comprehensive, long-range educational planning. As technological processes become more wide-spread in education, both as a result of increasing use and through broadening of the planning base, more effective means of interaction and development will be required. The effective use of consultants appears an important aspect of this developing situation.

APPENDIX

This appendix contains letters received from the respondents. All respondents were requested to write a short reaction to the concept of the education-industry planning consultant. Eleven such responses were received and are enclosed herein.

234

NISKAYUNA PUBLIC SCHOOLS



OFFICE of RESEARCH and DEVELOPMENT
STORY AVENUE
NISKAYUNA, NEW YORK 12309

JOSEPH H. OAKLEY
Director

Telephone
(518) 393-6651

May 4, 1970

Mr. Walter LeBaron
413 Seventh Street S. E.
Washington, D. C. 20003

Dear Mr. LeBaron:

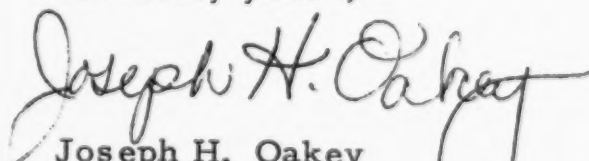
I would like to follow up on my telephone conversation with you regarding your study of the education industry planning consultant.

My position here at the Niskayuna Schools gets me involved in many relationships with the various industrial corporations and very often I feel at a great loss for the appropriate relationship which could be much more productive than it had been on many occasions.

For this reason I think that your study would be a most valuable one and I would certainly hope that the result of it is some sort of a test relationship to see if such a role could be productive.

I endorse your investigation most sincerely and would indicate that I am holding myself available for any further assistance I can give you in the course of your study.

Sincerely yours,


Joseph H. Oakley

JHO/gm

SYRACUSE UNIVERSITY

SCHOOL OF EDUCATION | CENTER FOR THE STUDY OF TEACHING

410 HUNTINGTON HALL | SYRACUSE, NEW YORK 13210

April 28, 1970

Mr. Walter A. LeBaron
413 Seventh Street, S.E.
Washington, D.C. 20003

Dear Mr. LeBaron:

Let me first of all say how pleased I was by our recent discussion concerning the aspects of your dissertation in which you are describing an environment for the effective education-industry planning consultant. I believe this to be an important area of study which has been largely ignored.

Having given our conversation some careful thought, I would like to offer the following summary opinions.

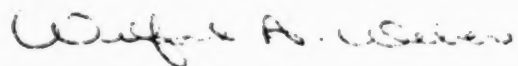
1. I believe that your treatment of the subject to have considered the full range of reality; without a doubt, you have dealt with the ideal situation, but you have also given thought to realistic parameters and potential limitations and hindrances.
2. I feel that your conceptualization in this regard to be quite sound; this is particularly encouraging in light of the paucity of work in this area.
3. I believe that the potential value of the paper is great; as educational planning becomes more complex and more systematic, the role of the consultant will be of increasing importance; there is a clear need for clarity regarding role and environment.
4. I think that the Model you have proposed is solid in all respects; it is built on assumptions which seem logical; while it does remain for the Model to be tested empirically, you have provided a framework in which this can be done meaningfully.
5. I believe that the description has one potential failing; if your work is to be useful to those who would utilize education-industry planning consultant, you will need to flesh out your writing a bit more; this is not to fault your work but only to suggest that the potential "consumer" is not sufficiently sophisticated to understand your work without further clarification; such clarification might be accomplished through the utilization of more examples.

Mr. Walter A. LeBaron
April 28, 1970
Page 2

236

As you can see, my general reaction to your work is highly positive. I am looking forward to reading the final document and wish you the best in completing this aspect of your work.

Sincerely,



Wilford A. Weber
METEP Project Director

WAW/jg



Guidance Associates of Pleasantville, N.Y.

237

244

OFFICE OF THE PRESIDENT

April 27, 1970

Mr. Walt Le Baron
Systems Analyst Senior
Education Systems Department
System Development Corporation
5720 Columbia Pike
Falls Church, Virginia 22041

Dear Walt:

Our discussion in my office on April 6 was a valuable one for me. The often confused relationship between industrial institutions and educational institutions in this country requires that more bright men begin to seek answers to the kinds of questions you asked me. Our conversation has provided me with useful food for thought.

With a growing population and a growing body of information available for the process of education, our problems are multiplying swiftly. Inevitably, technologies and methods proliferate. Just as the tasks and the alternative methods of education are becoming more diverse and complex, we are finding also a greater number of institutions and groups of people involved with the educative process in our society. Intelligence requires that we analyze and harness the interests of students, parents, teachers and administrators, government agencies, and producers of hardware and software. All of these entities and more are involved as elements in a system, and the individual entities involved often have great difficulty in seeing their own proper and most constructive places within the system. For professional educators, the analytical task is awesome. For publishers, the definitions of responsible activity become harder to discern. For the publisher with a real conscience about the ultimate classroom results of his efforts, the difficulty of planning is particularly acute. The reason is that all of us know that it is possible to sell junk in the field of education today. All too many companies are making money that way.

All of this dictates the genuine immediate need for an analytical specialist, a consultant of the kind you have described in your prospectus. This specialist must be conversant with the people in the several interest groups involved in the enterprise of education. He must help them to understand one another in order

Walt Le Baron

- 2 -

April 27, 1970

to augment consensus about goals. Then, he must be able to postulate an efficient marshaling of resources in the interest of attaining those goals. At present, there is entirely too much trial and error involved for everyone concerned. The result, I think, is a definite discount in the effectiveness of education for the students themselves.

The specialist we are discussing must be interlocutor, diplomat, systems analyst, administrator, and a perpetual student of education. Also, he must be gifted with a certain idealism, for we know that there are great possibilities for fraud in this kind of consultation. Unfortunately, I know of very few people today who possess this configuration of personal qualities. Furthermore, I can't say that I know of any training program that is about to produce any. For the moment, it is up to men like you who are willing to bring experience and several disciplines of study together, to inform your professional lives. I believe that your skills and personal qualities will give you a running head start in pioneering this field. Hence, my personal interest in lending you whatever insights and personal encouragement I can at this time.

Sincerely yours,

Wendell Shackelford
Wendell Shackelford
President

WS/bc



239

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OFFICE OF EDUCATION
WASHINGTON, D.C. 20202

April 28, 1970

Mr. Walt LeBaron
413 Seventh Street, S.E.
Washington, D.C.

Dear Mr. LeBaron:

As I indicated in our recent interview, I find your concept of an education-industry planning consultant both exciting and filling a real need. There can be little doubt that the rapid expansion in technology (both educational and other), the development of management techniques, the entry of private industry into the educational field, the whole concept of the systems approach to problem analysis and the possibility of its application in the field of education have added immeasurably to the task of the professional educator. Inflation coupled with the tax revolt evidenced by the failure of many school bond issues points up the increasing and urgent need for the educational community to become more cost-efficient and cost-effective. Long-range planning is no longer an educational luxury; it is rapidly becoming an educational must.

I believe that an education-industry planning consultant as described in your dissertation would not only be helpful to the educator in bringing to him the advances (technological and managerial) that are the outgrowth of this country's industrial expertise, but would bring to industry a knowledge and understanding of educational problems and processes. This communion of ideas, this mutual comprehension of problems, is essential if the children in our schools are to receive the quality education to which they are entitled and which our technology and knowledge are capable of providing. Your education-industry planning consultant, by bridging the gap between the world of industry and the world of education, would seem a hopeful step in this direction.

In our rather lengthy interview, I believe we covered all comments I had to make regarding the contents of your paper. There is one

Page 2 - Mr. Walt LeBaron

hope and one concern, however, which I would like to state again. I would hope that the educational community would take the initiative in the utilization of the education-industry planning consultant, for I fear that if industry takes the initiative, there is danger that the consultant would, in effect, become the "captive" of industry--a super-salesman, in fact. My concern is related to this fear: how do you keep even the educationally oriented education-industry planning consultant from becoming "contaminated" by his knowledge of and faith in a particular solution (hardware and/or software) to a given problem (e.g. severe reading problems of inner-city children)?

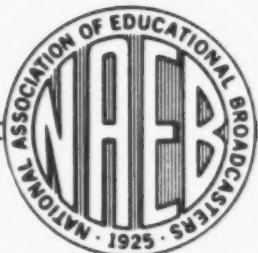
I think your dissertation makes a real contribution to the field of education, and I would hope that you might show the way by becoming an education-industry planning consultant.

Best wishes.

Sincerely,

Julia E. Hamblet

Julia E. Hamblet
Associate Director
National Right to Read Effort



NATIONAL ASSOCIATION OF EDUCATIONAL BROADCASTERS

1346 CONNECTICUT AVENUE • WASHINGTON, D. C. 20036
OFFICE OF RESEARCH AND DEVELOPMENT

April 28, 1970

Mr. Walt LeBaron
Education Planning
413 Seventh St., S.E.
Washington, D.C.

Dear Walt:

I am very impressed and very enthusiastic about your inquiry into the role of the consultant in effecting educational change and innovation. Our own work in this area strongly supports the notion that a third party role is an essential ingredient, not only in planning for educational development but in implementing such plans.

Your delineation of the specific services that can be seen as appropriate to the educational consultant's role is very helpful. They represent those areas of insight and operation which are seldom possible within the context of a staff capability and can only be expected through the sustained intervention of the consultant.

It was good to talk these matters over with you and I look forward to seeing the finished document.

Best regards.

Sincerely,

James A. Fellows
Director

JAF:bb

PUBLIC SCHOOLS OF THE DISTRICT OF COLUMBIA
SUPERINTENDENT OF SCHOOLS
PRESIDENTIAL BUILDING
418 - 18TH STREET, N. W.
WASHINGTON, D. C. 20004

April 20, 1970

Mr. Walter Le Baron
413 Seventh Street, S. E.
Washington, D. C. 20003

Dear Mr. Le Baron:

At the outset I feel compelled to compliment you for generating, and your doctoral advisors for supporting the development of this study. In my judgment, the scope and content go far beyond the surface rhetoric which has heretofore appeared in the literature.

In addition to those reactions you may have gleaned through our lengthy interactions, I should like to provide some commentary in linear form attending to at least four domains.

The first regarding a message which appears to be communicated through your discussional perspective is an assumption that "industry is ready" and/or but "are the schools ready." I recognize that your dissertation target population is geared primarily, although not exclusively to those of us in publication. My comments do not direct themselves directly to the role of the consultant, but I believe are significant in that they will be directed toward the "willingness of industry," hence the connection to the role of the consultant.

My experience as a practitioner has been that industry (corporate conglomerates) have been unwilling to invest in educational program development which is either long-term in extent, nor requires a heavy research and development or capital expenditures. My experience has been that the potential profit margin is insufficient when compared to the yield contained in product development in the more traditional consumer product fields. Profit and loss is the "name of the game" in the corporate world and I believe that responsible conglomerate leaders tend to look at all of their groups or sub-divisions with the "same set of eyes."

I do not wish to communicate that this corporate attitude is necessarily irresponsible, and could in fact be conceived as having real understanding of the problems. For example, it may recognize that in product sales, research and development, marketing, etc., - in a sense "errors" can be passed on to the consumer in increased product costs; and perhaps industry recognizes that public education does not have the risk capital sufficient to pay for product development. Industry

may also recognize that they may not have sufficient skills to operate in the real world of human behavior required in education rather than training.

This is not to say that industry will not, nor can not make a significant contribution, perhaps with a re-ordering of our national priorities and/or a re-definition of profit and loss margins - industry will become seriously involved.

A second domain is that of accountability. Some of us in education are committed to becoming responsive and responsible to our consumers (learners). In this connection, and assuming that for the present our risk capital will remain small, we will be demanding of those who work with us - some form of guaranteed product delivery. Perhaps in your model you can design-in a system of accountability which would be viable with any of the consultant prototypes you have developed.

A third dimension for which I have concern is the development of a mechanism which will allow for the consultant to maintain "creditability." All of us recognize that we live in a world of massive mistrust, and that there will be those who will believe that the consultant is either "on the take" or has "sold out" to the other party. This notwithstanding, there needs to be some way that the various parties will know that the consultant is "alive and can contribute" without his being conceived as a self promoter or in being promoted by someone else.

Fourth, and I am certain you were not trying to appeal to the educationalist, I am not certain that the consultant needs to have been "primarily an educator" in the classical sense, i.e. having played the musical chairs from classroom teacher to football coach to the higher ups. My bias would be that this person have a more thorough grounding in philosophy, psychology, technology, systems, etc., which would enable him to design and plan for the development of an educational system in a systematic fashion only when the more fundamental questions concerning societal direction are accounted for. A good system which takes us in the wrong direction may be far worse than a lack of system which attends to humanistic and societal concerns.

Finally, when searching for new personnel a reasonable question to ask of a former employer is whether he would not hire the person in question. I should like to advise you as Superintendent elect of a major urban school system, that I am interested in engaging the services of the man you have described in your model - to start work immediately.

Best wishes, and continued success with the development of the model.

Sincerely yours,

Robert La Penna

Robert La Penna
Assistant Superintendent

LIDLAW BROTHERS

A Division of Doubleday & Company, Inc.

River Forest, Illinois

April 16, 1970

Mr. Walt Le Baron
Education Planning
413 Seventh Street, S.E.
Washington, D.C. 20003

Dear Walt:

I enjoyed having the opportunity to participate in your dissertation work on The Education-Industry Planning Consultant an Emerging Role.

As I indicated in my interview with you, my reaction to your prospectus is excellent. Having seen your work I am doubly convinced that there is a vital need in both education and industry for a planning consultant.

Your description of the role of the consultant and the nature of his function would seem to me to be a valuable guide to educators in general who are having great difficulty in trying to relate scientific and technological changes to their immediate school programs. Many of the big industrial complexes that have tried to become involved in education use a "medicine show" approach to huckstering their product. By the time the average educator is hit with the advertising and promotional bits, he is thoroughly confused as to the relevance of some of this new equipment.

I should think that a planning consultant who could help a school system evaluate, plan and implement additions and improvements to its programs would be worth his weight in gold!

I am afraid I took entirely too much of your time in discussion but as a practicing businessman in an industry closely related to education, I was very impressed with the depth of your prospectus and the more I have thought about it, the more I see that it will meet a very critical need in both education and industry.

Cordially yours,

William R. Dudenhausen

William R. Dudenhausen
Executive Vice President

WRD;ml

ENCYCLOPÆDIA BRITANNICA EDUCATIONAL CORPORATION

425 NORTH MICHIGAN AVENUE • CHICAGO, ILLINOIS 60611 • PHONE: (312) 321-6800

April 17, 1970

Mr. Walt Le Baron
Education Planning
413 Seventh Street, SE
Washington, D.C.

Dear Walt:

How nice to have talked with you in Chicago the other day!
I must apologize for taking such a long time to work my
way through the material you asked me to respond to.

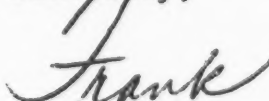
Your prospectus is excellent. It is thoughtfully prepared
and is comprehensive. It illustrates considerable insight and
much experience in field consultation and program planning.
I found, as you can see, little to quarrel about.

As education further develops its own particular politics
and as it becomes increasingly "technologized," we'll likely
find more planning strategies accomplished at state and
regional levels, rather than at local building or district
levels. Today's sanction system will become, then, tomorrow's
implementation group. Somehow I get the feeling that the
prospectus doesn't quite deal with sanction versus implemen-
tation and with strategy versus tactical decision making.
But I can't find a convenient tool to suggest be used to
accommodate this notion.

I will follow your dissertation with interest. I'm so pleased
you're doing it. It needs to be done. I hope you'll keep me
advised of progress and, of course, how I can further help
toward insuring its successful conclusion.

Keep in touch.

Sincerely,



Frank A. Anderson, Director
Program Planning

FAA:gh
Enc.

**COMMITTEE ON PLANNING AND
ORGANIZATIONAL DEVELOPMENT**

James R. Nelson, Chairman
P. O. Box 164
Kirkland, Washington 98033

Mrs. Vivian Bowser
3215 Charleston
Houston, Texas 77021

Mrs. Louise Emmett
3617 Lyndale Place
Fort Worth, Texas 76133

Elmer C. Gast
935 Boulevard Road
Keokuk, Iowa 52632

George G. Gumeson
6500 Soquel Drive
Aptos, California 95003

James A. Harris
7215 Reite
Des Moines, Iowa 50311

Frederick L. Hipp
180 W. State Street
Trenton, New Jersey 08608

**DIRECTOR OF PLANNING &
ORGANIZATIONAL DEVELOPMENT**

Jack H. Kleinmann



National Education Association

1201 SIXTEENTH STREET, N. W. ■ WASHINGTON, D. C. 20036 ■ 202/223-9400

**Office of Planning and
Organizational Development**

April 14, 1970

Mr. Walt Le Baron
Education Planning
413 Seventh St., S. E.
Washington, D. C.

Dear Mr. Le Baron:

As agreed between us, I have carefully studied your prospectus: The Education-Industry Planning Consultant -- An Emerging Role. I have made numerous margin notes on the document dealing specifically with various points as they arise. The purpose of this letter is to furnish an overall reaction to the concept and the way the concept is developed in your paper.

I believe that a study such as yours is badly needed in the field. I could find no factors related to the E-I consultant's role that have been overlooked. The prospectus treats each of these factors in sufficient depth. The completed dissertation should be a major contribution to a rapidly emerging field and should fill a need which will increasingly become apparent in the years immediately to come.

It seems to me that the relationship between the consultant and his employer is of paramount importance. Without particularly careful delineation of this relationship there might arise many questions in the "conflict of interest" arena. I would urge that detailed attention be given to this very important aspect of the general framework that is established. Again, generally speaking, I find the prospectus to be most worthy and stimulating. I look forward to studying the completed dissertation.

Sincerely yours,

Jack H. Kleinmann
Jack H. Kleinmann

JHK:hn





247

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OFFICE OF EDUCATION
WASHINGTON, D.C. 20202

April 15, 1970

Mr. Walt LeBaron
Education Planning
413 Seventh Street, SE.
Washington, D.C. 20003

Dear Walt:

Thanks very much for the opportunity to review your prospectus. You certainly have a thorough conceptualization of the role and function of an education-industry planning consultant. I would certainly concur that the perceived need for such a consultant is authentic and valid. The qualifications envisioned for such a consultant are extremely high and such an individual should consequently be entirely capable of giving the highest level of service to both industry and education. Your dissertation, if developed from this prospectus, should make quite a contribution to a completely undeveloped domain.

There are a couple of areas in which I have some concern over the role of the education-industry planning consultant. Your prospectus addresses this problem in an indirect manner in the portion devoted to "integrity of function". The remaining unanswered question is how does the consultant maintain the necessary objectivity in relation to, and aloofness from, the industrial sector in order to adequately function in the educational sector. This problem is somewhat magnified by virtue of the fact that the consultant allegedly has industrial clients as well as educational clients.

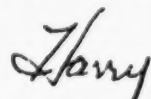
I would be inclined to advocate an "industrial-consultant" relationship along the lines of developing performance specifications for major hardware systems which have been developed from a persistent and compelling need arising in the educational community. Perhaps another name for this concept is "rigorous sophisticated performance oriented contracting". In my judgment

Page 2 - Mr. Walt LeBaron

such contracting would be a significant breakthrough in both the industrial and educational domains as they mutually aspire to greater intersections. I also feel that the consultant could perform a vital service in facilitating such arrangements without presenting any potential conflict of interest problems.

I hope these observations may be of some assistance as you proceed to complete a very creative and challenging dissertorial topic.

Sincerely yours,



Harry L. Phillips
Director, Division of
State Agency Cooperation

Enclosure

249

THE UNIVERSITY OF THE STATE OF NEW YORK
THE STATE EDUCATION DEPARTMENT
ALBANY, NEW YORK 12224

CENTER FOR PLANNING AND INNOVATION IN ELEMENTARY,
SECONDARY AND CONTINUING EDUCATION

NORMAN D. KURLAND, DIRECTOR

518: 474-2380

MARK B. SCURRAH, ASSISTANT DIRECTOR

518: 474-2384

ALAN S. HOFFMAN, ASSISTANT DIRECTOR

518: 474-2386

C. JOSEPH AMYOT	474-2388
GENEVIEVE B. BOSSON	474-2386
FRED Q. BOWMAN	474-2386
WALTER E. SCHOENBORN	474-2386
OSCAR D. SIMMONS	474-2362
BINGHAM L. PARKIN	474-2387

AREA CODE: 518

May 6, 1970

Mr. Walter LeBaron
413 Seventh Street SE
Washington, D. C. 20003

Dear Mr. LeBaron

This is to officially confirm our telephone conversation and several direct meetings that we have had on an interview basis concerning your prospectus for "The Education-Industry Planning Consultant."

I will be very brief in summarizing the reactions that I had as indicated on the prospectus and as described during our discussions on the paper. They are as follows:

1. A definition of terms is important, particularly those that are new to the ears of educators. I refer to such terms as "broad-based technological implementations," "systems," "training packages," and so forth.
2. Avoid statements that you cannot substantiate with factual evidence. It may not be so that there is "distrust between industrial representatives and the school superintendent" as you stated on one of the pages in the prospectus.
3. Look for positive views by the educator in terms of industry's role.
4. Is it so that the schools evolve from a poorly defined consensus to be all things to all people? I'm not so sure that they serve too many people outside of the four walls.
5. The education-industry planning consultant is a human being of course and cannot necessarily stay within the frame of objectivity in terms of his relationships with either industry or education. There is no assurance that he will be detached from bias.

(continued)

Walter LeBaron

Page 2

May 6, 1970

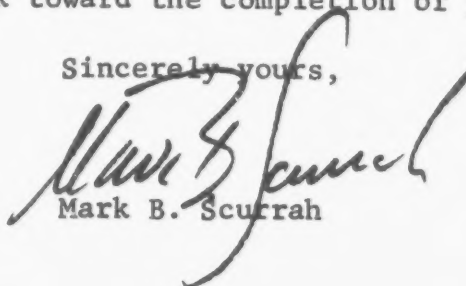
6. Be sure that the role of this consultant emphasizes short-range goals as well as the long-range and comprehensive planning activities that you indicated.
7. Under your topic of "Limitations on the Education-Industry Planning Consultant's Functions" I thought that the four starred roles of the consultants considered inappropriate were well stated.
8. You raised a question on "Who Involves the Consultants?" The point of entry of the consultant will probably determine the extent to which he feels a sense of loyalty. Obviously, if the school is paying his fees, then he will be more inclined to react accordingly without losing his continued consultant fees. The same would apply if he were hired by industry. Should he be hired part by industry and part by school funds when dealing with a single industry-school situation?

These are just a few of the major items I mentioned to you and of course you know about many minor improvements that I felt could be made.

I really feel that you are on to a very good possibility here. I feel that this position will be emerging. At least I feel that it certainly has a place more clearly now than ever before. As you know, our office has employed numerous persons of this type and we have found their services to be of great help to us as we at the State level try to develop goals and programs for the 70's.

I wish you luck in your work toward the completion of your doctorate.

Sincerely yours,



Mark B. Scurrah

lmw
Enclosure

BIBLIOGRAPHY

- Ackoff, Russell L., A Concept of Corporate Planning. New York: Wiley Interscience, 1970.
- Adams, Don, ed., Educational Planning. Syracuse, New York: Center for Development Education, Syracuse University Press, 1964.
- American Association of School Administrators, Administrative Technology. Stephen J. Knezevich, ed., Washington, D.C.: National Education Association, 1969.
- Anthony, Robert N., Planning and Control Systems: A Framework for Analysis. Boston: Graduate School of Business Administration, Harvard University, 1965.
- Argyris, Chris, "The Individual and the Organization: Some Problems of Mutual Adjustment." Administrative Science Quarterly. II (June 1957) 7-29.
- Banghart, Frank W., Educational Systems Analysis. New York: Macmillan, 1969.
- Bennis, Warren G., Organization Development: Its Nature, Origins, and Prospectus. Reading, Massachusetts: Addison-Wesley, 1969.
- Benson, Charles S. and James W. Guthrie, An Essay on Federal Incentives and Local and State Educational Initiative. Berkeley, California, December 1968.
- Bereday, George Z.F., Joseph A. Lauwerys, and Mark Blaug, eds., The World Yearbook of Education, 1967: Educational Planning. London: Evans Brothers, 1967.
- Boguslaw, Robert, The New Utopians: A Study of Systems Design and Social Change. Englewood Cliffs, New Jersey: Prentice-Hall, 1965.
- Branch, Melville C., Planning: Aspects and Applications. New York: Wiley, 1966.

- Brooks, Richard D., Comprehensive Planning in State Educational Agencies. Madison Wisconsin: Wisconsin Department of Public Instruction, 1968.
- Buchmiller, Archie A., Central Comprehensive Educational Planning: A Role for State Educational Agencies. Madison, Wisconsin: Wisconsin Department of Public Instruction, 1969.
- Bushnell, Don O. and Dwight D. Allen, The Computer in American Education. New York: Wiley, 1967.
- Chirikos, Thomas N. and A.C.R. Wheeler, "Concepts and Techniques of Educational Planning," Review of Educational Research. XXXVIII (June 1968) 264-276.
- Commission on Instructional Technology, To Improve Learning. Washington, D.C.: The Commission, August 1969.
- Coombs, Philip H., The World Educational Crisis: A Systems Analysis. New York: Oxford, 1968.
- Costa, Arthur L., "Strategies for Developing Autonomous Learners," Audiovisual Instruction. 13:8 (October 1968) 832-834.
- Curle, Adam, Problems of Professional Identity: An Examination of Training for Human Resource Development and Educational Planning. Occasional Paper No. 6, New York: Education and World Affairs, July 1968.
- Davis, Russell C., Planning Human Resource Development: Educational Models and Schemata. Chicago: Rand McNally, 1966.
- Dorfman, Robert, ed., Measuring Benefits of Government Investments. Washington, D.C.: Brookings Institution, 1965.
- Elam, Stanley and Gordon I. Swanson, eds., Educational Planning in the United States. Second Symposium on Educational Requirements for the 1970's, An Interdisciplinary Approach, Phi Delta Kappa, Itasca, Illinois: F.E. Peacock, 1969.
- Educational Television: The Next Ten Years. Bulletin 1964, No. 12, Washington, D.C. U.S. Office of Education, 1965.

- Furse, Bernarr S. and Lyle O. Wright, eds., Comprehensive Planning in State Education Agencies. Salt Lake City, Utah: Utah State Board of Education, 1968.
- Factors Affecting Research and Exploratory Development. Cambridge, Massachusetts: A.D. Little, April 1965.
- Gagne, Robert, ed., Psychological Principles in Systems Design. New York: Holt, Rinehart, and Winston, 1965.
- Gerard, Ralph W. ed., Computers and Education. New York: McGraw-Hill, 1967.
- Hall, Arthur D., A Methodology for Systems Engineering. Princeton, New Jersey: Van Nostrand, 1962.
- Harris, Chester W. ed., Encyclopedia of Educational Research. Third Edition, New York: Macmillian, 1960.
- Harris, Norman C., "On Being a Consultant," Junior College Journal, XXXVII (April 1967) 9-13.
- Hartley, Harry J., Educational Planning-Programming-Budgeting: A Systems Approach. Englewood Cliffs, New Jersey: Prentice-Hall, 1969.
- Heddinger, F.M. "Industry's Role in Education Defined," American School Boards Journal, 155 (September 1967) 30-35.
- Helmer, Olaf and Nicholas Rescher, "On the Epistemology of the Inexact Sciences," Management Sciences, 6 (1959) 48.
- Helmer, Olaf. Social Technology. New York: Basic Books, 1966.
- Henrie, Samuel N. Jr., and Higgins D. Bailey, "Planning Carefully or Muddling Through: An Educator's Choice," Journal of Secondary Education, XXXIII (December 1968) 249-352.
- Hill, John C., "Long-Range Educational Planning," Comparative Education, XXXIV (May 1968) 268-279.
- Holton, Gerald, "The Education Industries: A Discussion," Harvard Education Review, 37 (Winter 1967) 110-142.

- Homme, Lloyd, Contingency Management. Albuquerque, New Mexico: Westinghouse Research Laboratories, 1967.
- Hunt, J. McVicker, "The Psychological Basis for Using Pre-School Enrichment as an Antidote for Cultural Deprivation," Pre-School Education Today, Fred M. Hechinger, ed., Garden City, New York: Doubleday, 1966.
- Joyce, Bruce R. "The Development of Teaching Strategies," Audio-visual Instruction, 13:8 (October 1968) 820-823.
- Kent, W.P., Walt Le Baron, and Robert Peterson, Feasibility of Using an Experimental Laboratory for Identifying Multi-Media Problems and Requirements. Falls Church, Virginia: System Development Corporation, June 1968.
- Kerr, Clark, The Uses of the University. Cambridge, Massachusetts: Harvard University Press, 1964.
- Kintzer, Frederick C and Stanley M. Chase, "Consultants as Change Agents," Junior College Journal, XXXIX (April 1969) 53-55.
- Komoski, P. Kenneth, "The Second Industrial-Instructional Revolution," Teachers College Record, 71 (December 1969) 327-338.
- Lave, Roy E. Jr. and Donald W. Kyle, "Applications of Systems Analysis to Educational Planning," Comparative Education Review, XXII (February 1968) 39-56.
- Leavitt, William, "RAND: The Air Force's Original Think Tank," Air Force/Space Digest, May 1967, pp. 100-109.
- Le Breton, Preston P. and Dale A. Hennig, Planning Theory. Englewood Cliffs, New Jersey: Prentice-Hall, 1961.
- Locke, Robert W., "Education and Business: How Much of a Partnership?" Business Education World, 48 (October 1967) 5-6.
- Mockler, Robert J., "Theory and Practice of Planning," Harvard Business Review, 48 (March-April 1970) 148-159.
- Molnar, Andrew R. and Beverly Sherman, U.S. Office of Education Support of Computer Activities. Washington, D.C. U.S. Office of Education, 1969.

- Morphet, Edgar L. and David L. Jesser, eds., Planning for Effective Utilization of Technology in Education. Denver, Colorado: Designing Education for the Future, 1968.
- Morse, Dean and Aaron W. Warner, eds., Technological Innovation and Society. New York: Columbia University Press, 1966.
- Novick, David, ed., Program Budgeting.... Santa Monica, California: RAND, 1965.
- Oettinger, Anthony G. with Sema Marks, Run, Computer, Run: The Mythology of Educational Innovation. Harvard Studies in Technology and Society, Cambridge, Massachusetts: Harvard University Press, 1969.
- O'Toole, John F., Systems Analysis and Decision-Making in Education. Santa Monica, California: System Development Corporation, 1965.
- Ozbekhan, Hasan, "Towards a General Theory of Planning," Perspectives of Planning. Erich Jantsch, ed., Paris: Organization for Economic Cooperation and Development, 1969.
- Pifer, Alan, "Foundations and the Unity of Charitable Organizations," Annual Report for 1969, The Carnige Corporation, New York: The Corporation, 1969.
- Proceedings of the Engineering Systems for Education and Training Conference, Arlington, Virginia: National Security Industrial Association, June 14-15, 1966.
- Rivest, Lloyd E., Instrumentation Systems for Group Instruction. Schenectady, New York: General Electric R&D Center, July 1967.
- Rossi, Peter H. and Bruce J. Biddle, eds., The New Media and Their Impact on Society. Garden City: Doubleday, 1966.
- Saettler, Paul, "Instructional Technology: Some Concerns and Desiderata," AV Communications Review, 17 (Winter 1969) 357-361.
- Sackman, Harold, Computers, Systems Science, and Evolving Society: The Challenge of Man-Machine Digital Systems. New York: Wiley, 1967.
- Sanders, Donald P. "Toward a Theory of Educational Development," Comparative Education Review, XIII (October 1969) 276-298.

- Schein, Edgar H. and Warren G. Bennis, Personal and Organizational Change Through Group Methods: The Laboratory Approach. New York: Wiley, 1966.
- Silberman, Charles E., "Technology is Knocking at the Schoolhouse Door," Fortune, August, 1966, pp. 72-75.
- Skinner, B.F., The Technology of Teaching. New York: Appleton-Century-Croft, 1968.
- Smith, Robert G. Jr., The Design of Instruction Systems. Alexandria, Virginia: HumRRO, George Washington University, 1966.
- The State of State Departments of Education. The Fourth Annual Report of the Advisory Council on State Departments of Education, Washington, D.C.: U.S. Office of Education, 1969.
- Systems Analysis for Educational Planning. An Annotated Bibliography, Paris: Organization for Economic Cooperation and Development, 1969.
- Tucker, A., ed., A Modern Design for Defense Decision: A McNamara-Hitch-Enthoven Anthology. Washington, D.C.: Industrial College of the Armed Forces, 1966.
- U.S. Congress, Joint Economic Committee, The Planning-Programming-Budgeting System: Progress and Potentials. Hearings, Washington, D.C.: Committee Print, 1967.
- U.S. Congress, House of Representatives, Subcommittee on Education, Committee on Labor and Public Welfare, Notes and Working Papers Concerning the Administration for Programs Authorized Under Title III of Public Law 89-10, The Elementary and Secondary Education Act of 1965 as Amended by Public Law 89-750, Richard I. Miller, Study Director, Washington, D.C.: Committee Print, April 1967.
- Watson, Goodwin, ed., Concepts for Social Change. Washington, D.C.: National Training Laboratories-NEA, 1967.
- Watson, Goodwin, ed., Change in School Systems. Washington, D.C.: National Training Laboratories-NEA, 1967.

Ways, Max, "The Road to 1977," Fortune, January 1967, pp. 93-106.

Weinberg, Alvin M., "Can Technology Replace Social Engineering?"
Atomic Scientists, December 1966, pp. 44-50.

Wright, Lyle O., Developing Comprehensive Planning Capability in
State Education Agencies. Salt Lake City, Utah: Utah Board of
Education, 1969.

Wurtele, Zavia S., Mathematical Models for Educational Planning.
Santa Monica, California; System Development Corporation, 1967.